Protected Areas:
Preserving Our Future

An Environmental Education Guide to Protecting Natural Areas

SECOND EDITION

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Province of British Columbia
Ministry of Water, Land and Air Protection
Ministry of Forests

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Thousands of tired, nerve-shaken, over-civilized people are beginning to find out that going to the mountains is going home; that wildness is a necessity; and that mountain parks and reservations are useful not only as fountains of timber and irrigating rivers, but as fountains of life.
John Muir

[Parks] exist in order that every citizen of Canada may satisfy his craving for Nature and Nature's beauty; that he may absorb the poise and restfulness of the forests; that he may steep his soul in the brilliance of the wildflowers and the sublimity of the mountain peaks; that he may develop in himself the buoyancy, the joy and the activity he sees in the wild animals; that he may stock his mind with the raw materials of intelligent optimism, great thoughts, noble ideals; that he may be made better, happier, and healthier.
J. B. Harkin, first Commisioner of the National Parks of Canada (1875–1955)

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PROTECTED AREAS:
PRESERVING OUR FUTURE

An Environmental Education Guide to Protecting Natural Areas

SECOND EDITION

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Introduction

Thousands of years ago, certain areas considered sacred were established and given special protection. Forests venerated by the hunter-gatherer societies were the origin of ancestral woodland or hunting reserves in India, Africa and America.

There are sacred mountains in Australia and Europe, places charged with a powerful mythical and historical significance. Many of today's protected areas have evolved from these sites, such as Doñana, Ichkeul and Olympus. Later, kings, princes and nobles protected areas as private hunting grounds, such as the New Forest, in the south of England, some of which still exist and provide vital protection for wildlife and water sources.

The idea of protecting certain areas has spread in the last one hundred years or so, since 1872, when what is considered the world's first national park was established in Yellowstone, USA.

All of Us, 13: Environmental Education Dossiers (1994)

Raven

The objective of this learning resource is to explore the concepts, values, and practices that underlie the idea of protected areas (such as parks, ecological reserves and the like) by considering what we protect as individuals, why we protect certain things and places, how we go about doing it, and how we can participate in the ongoing care of our protected areas.

This learning resource has been designed to help you and your students examine the daily acts of protection in our homes and schools, as well as the role that communities and governments play as we deal with issues surrounding the use of land and resource. The values and attitudes that apply to protecting personal things in our lives also influence the decisions we make as a society about land use and protecting natural areas. The activities were conceived and developed by teachers and other environmental educators. The activities offer students an opportunity to:

- explore their own values with respect to protection;
- become aware of other people's values;
- think about some of the costs and benefits of protection;
- reflect on personal experiences in nature;
- increase their knowledge of biology and geography;
- manipulate real data;
- experience cooperative decision-making; and
- develop skills that will help them become involved in the democratic process of decision-making.

Program Rationale

By incorporating activities from this guide into your program, which can include science, social studies, language arts, math and outdoor education, students will practice the same process of philosophical, technical and economic analysis that underlies land-use decisions made in society. Students will also be reminded that many of their daily decisions involve the same kind of thinking.

Together these activities help you and your students sort out your thoughts on the complex issues of environmental protection.

Red Squirrel

Each activity includes:

- Activity Summary
- Learning Outcomes
- Key Concepts
- Key Terms
- Materials
- Time (based on a 50 minute period)
- Background Notes
- Instructions—"Let's Begin!"
- Questions for Journalling or Discussion
- Connections to applicable PROJECT WILD and *Backyard Biodiversity and Beyond* activities

To make your job easier, the guide also includes a series of Student Handout sheets. Student Handout sheets have been marked with this icon:

All Key Terms are defined in the Glossary (Appendix 8).

How to Use this Guide

This guide is intended for teachers of grade 5-7 students. Activities are designed for intermediate students; however, many activities in this guide can be adapted for elementary as well as high school students, or for the general public. The activities range from science to art, from a high-energy game to guided imagery, and from conducting a poll to surveying a habitat. Several drama activities encourage students to explore the issues personally, as do the "journalling" questions in each activity.

1. Routes Through Protected Areas: A Guide to the Guide!

There are a number of ways to move through a Protected Areas program with your students. One way is to use a local case study of a protected area. BC Parks has developed a number of local case studies for provincial parks throughout the province (see Appendix 11 for a list of parks with case studies.) These case studies highlight a local park in which a number of the activities from this guide can be done. Most case studies include information about its history, key features, and some information about park issues that can be useful to both teachers and students when studying protected areas. Most case study parks are chosen for their easy access and familiarity to students. Contact your local BC Parks District Office for further information on local case studies (see Appendix 3).

If you are using a BC Parks local case study, you can chose an activity from your case study guide or from this guide that focus on your local park. For example, you might choose the following activities:

SECTION 1	SECTION 2	SECTION 3	SECTION 4
What Does Protection Mean?	**Why Do We Protect?**	**How Do We Decide What to Protect?**	**Caring for Protected Areas**
• Choices—A Fiery Guided Imagery • Park Connections: Introducting your local Protected Area	• Who Lives Here? A Habitat Study	• Plants and Animals of Protected Areas	• Stewardship Bingo! • Mapping for Decision (in Chilcotin Case Study) • Local case study

Another way to incorporate a protected areas program with your students is to choose a number of activities from this guide for classroom and outdoor lessons. Here are some suggestions for activity choices and paths that highlight the guide's major concepts, sequenced according to the guide's four activity sections.

The Fast Lane (4 activities)

SECTION 1	SECTION 2	SECTION 3	SECTION 4
What Does Protection Mean?	**Why Do We Protect?**	**How Do We Decide What to Protect?**	**Caring for Protected Areas**
• Choices—A Fiery Guided Imagery	• What Does Your Community Think?	• Plants and Animals of Protected Areas	• Stewardship Bingo!

If you only have time to do a few activities, here is a "bare bones" selection:

A Highlights Tour (7 activities)

SECTION 1	SECTION 2	SECTION 3	SECTION 4
What Does Protection Mean?	**Why Do We Protect?**	**How Do We Decide What to Protect?**	**Caring for Protected Areas**
• Choices—A Fiery Guided Imagery • Family Treasures Go Time Travelling	• Exploring Our Different Values • Who Lives Here? A Habitat Study	• Habitat Islands	• Stewardship Bingo!

If you have a little more time, here is a list of activities that will allow your students to explore protection more fully:

A Scenic Route (8 activities)

Take the scenic route for a more in-depth look at protected areas!

SECTION 1	SECTION 2	SECTION 3	SECTION 4
What Does Protection Mean?	**Why Do We Protect?**	**How Do We Decide What to Protect?**	**Caring for Protected Areas**
• Choices—A Fiery Guided Imagery • Protection Webs • Protected Areas Around the Corner	• My Special Place • Who Lives Here? A Habitat Study • Exploring Our Different Values	• Habitat Islands • Plants and Animals of Protected Areas	• Stewardship Bingo! • Paint a Stewardship Mural

2. Key Concepts

The guide's key concepts are explored through a set of activities that examines protection through the themes of "What Does Protection Mean?, Why Do We Protect?, How Do We Decide What to Protect?, and Caring for Protected Areas."

How to Use the Key Concepts

The key concepts can be used to:

- plan teaching units or school projects;
- act as guidelines for developing a comprehensive, school-wide, cross-grade or cross-subject plan for protected areas education;
- serve as a template to help assess prior knowledge and learning;
- help students to plan and monitor their own learning projects; and

- help schools and community agencies develop joint Protected Areas Projects and assist in monitoring the results of the projects.

It is important to remember that the key concepts have been developed for both teachers and students. Students need to be introduced to the concepts and then have these reinforced through activities and experiences. Students can be encouraged to develop their own metaphors, examples, and illustrations for the key concepts. By doing so, they can develop a real understanding of what each concept means.

Key Concepts

1. We protect things that are valuable to us. Our heritage and culture influence our values.
2. Protected natural areas are important for many reasons. They provide ecological, scientific, spiritual, cultural, recreational, and economic benefits.
3. Many protected areas are islands of natural habitat surrounded by human development.
4. To sustain protected areas, we need to make management decisions based on knowledge of the local environment.
5. Protection is an ongoing and complicated process that has both costs and benefits.
6. Protected areas are affected by our actions within and beyond their boundaries. Successful protection depends on the commitment of everyone involved.
7. Stewardship refers to caring for what we don't or can't own. By caring for protected areas we can become stewards of the land.

3. Curriculum Links

The activities in this guide have been cross-referenced to provincial Integrated Resource Package (IRP) Learning Outcomes (LO) for Social Studies, Language Arts, Science, and CAPP for grades 5-7. A summary of learning outcomes matched for each activity may be found in Appendix 10. All activities in this guide also have learning outcomes listed after the "Activity Summary" in each section. For information on grades K-12 IRP matches with this guide, please see the Wild BC website at *www.hctf.ca/wild.htm* for a complete matrix of all subject areas.

4. Background Information on Protected Areas in British Columbia

What Are Protected Areas?

In British Columbia, there are many different types of protected areas. They include:

- public lands in networks of national, provincial and regional parks
- recreation areas
- wildlife management areas
- ecological reserves
- wilderness areas
- greenways and municipal parks
- nature sanctuaries
- heritage buildings
- cultural heritage sites

Protected areas also include places that are not owned by the public, but are protected by a range of federal, provincial or local regulations. These types of protected areas include local areas such as watercourses (rivers, streams, lakes, ponds, wetlands) and their riparian (streamside) areas, environmentally sensitive areas, and other areas of noted local importance.

Protected areas range in size from vast expanses of wilderness areas to tiny pockets of nature covering a few hectares or less. Together, protected areas on public and private lands provide ways to protect natural ecosystems and biodiversity as well as to enhance and restore local natural areas.

Why Do We Need Protected Areas?

The Caracas International Congress on National Parks (1992) declared that protected areas are needed:

1. To safeguard areas that are exceptional for health, natural beauty, uniqueness, cultural significance, and as sources of inspiration.
2. To maintain the diversity of ecosystems, species, genetic variety and ecological processes that guarantee the existence of life.
3. To protect species and genetic varieties that humans need, especially for food and medicines.
4. To preserve the homelands for human groups with traditional cultures and knowledge of nature.
5. To protect those landscapes that reflect the history of human interaction with nature.
6. To satisfy the society's scientific, educational, recreational and spiritual needs.
7. To benefit local and national economies and act as models for application of sustainable development elsewhere.

What Are Areas Protected From?

The simple answer is modern society. The most obvious problems are large-scale resource extraction and development, such as logging, mining, oil and gas drilling and hydroelectric dams, which completely alter natural areas. Road building, urban sprawl, and even some of our recreational activities also threaten natural areas. We draw boundaries around the areas we wish to protect, in order to control, restrict or ban the human activities that threaten what we value as a society.

How Much To Protect?

In 1984, the World Congress on National Parks identified that 4 percent of the Earth's land surface was protected in order to preserve species and ecosystems and that perhaps 3 times as much should be protected to ensure preservation of a representative sample of the world's ecosystems. A further call in support of this figure of 12 percent was taken up by the UN's World Commission on Environment and Development (the Bruntland Commission) in 1987, and by Canada's Endangered Spaces campaign. In 1993, the government of British Columbia set a goal to reach the 12 percent protection level by the year 2000. As a result, the provincial park system was expanded significantly to more than 800 protectes reas and, by early 2001, the province had met the 12 percent goal. The total of public protected areas in BC now (2001) contain nearly 12 million hectares of the province.

What About Parks?

British Columbia's protected areas system serves many purposes. Some parks protect critical wilderness habitat, while others were created to preserve outstanding spaces for outdoor

recreation. Many protected areas contain heritage features such as important aboriginal sites as well as other historical and cultural sites valued by all British Columbians.

The largest part of British Columbia's system of protected areas is administered by BC Parks. BC Parks is responsible for the stewardship of more than 11 million hectares and is accountable to British Columbians for managing this trust and legacy for future generations. BC Parks is also accountable for the health and survival of the ecosystems and organisms living in our protected areas and must ensure suitable conditions to preserve ecosystem integrity. Finally, BC Parks must contribute meaningfully to the lives of British Columbians directly through economic benefit or indirectly by providing options to future British Columbians.

How Are Areas In B.C. Chosen for Protection?

The government of British Columbia developed the Protected Areas Strategy (1993) as a method of selecting which areas of the province to add to the protected areas system. The federal government has a separate plan to protect representative samples of different regions across the country. Choosing what areas to protect is difficult because decision makers have much to consider:

- What does it mean to protect an area?
- How do we decide which areas to protect?
- What level of protection is required?
- How large should the areas be?
- What are the costs?
- What are the benefits?
- How can the multitude of opinions about protected areas be taken into account?
- What role should First Nations have in managing protected areas?
- How should decisions about protection be made?
- How should protected areas be managed, and by whom?

Red-backed Salamander

These are all difficult questions whose answers reflect a particular set of values.

The provincial government decided on two major goals for a system of protection.

- The first goal is to protect examples of the *natural diversity* in British Columbia. This means choosing representative examples of our many landforms and ecosystems—from the snow-clad mountains, timbered hills, and grasslands, to rocky and sandy coastlines, lakes, rivers and fjords. It also means finding out where plants and animals make their homes, and locating areas important to our cultural history and our current recreational interests.
- The second goal is to protect *special natural features*. This means determining where rare or endangered plant and animal species live, and locating areas critical for wildlife survival. It means looking for unique geological formations, as well as cultural heritage features such as ancient village sites, and recreational features such as trails.

Maps created by government biologists and geographers show the locations of plants, animals,

climate patterns, landforms and special features of British Columbia, as well as human disturbances such as settlements, roads, logging and mining. Scientists and planners use these maps, and also look at territory and other habitat needs of plants and animals. With this information, they identify areas that should be considered for protection. Increasingly, the public is invited to provide information and make proposals as well.

What About the Rest of the Country?

The land classification system used by the federal government to designate national parks is different from the provincial system. With this classification system, Canada is divided into 39 natural regions that represent the Canadian landscape. The federal government's goal is to protect areas that represent these regions, and to set aside, with other governments and organizations, 12 percent of Canada as protected space.

The federal government also protects and commemorates important aspects of Canada's history through a system of national historic sites. These include aboriginal sites, fur trade forts, railway stations, and places that reflect historic events and people. Some of Canada's protected areas have outstanding significance, and are recognized internationally as World Heritage Sites by the UNESCO World Heritage Convention. World Heritage Sites in B.C. include:

- the Canadian Rocky Mountain Parks (Banff National Park, Jasper National Park, Kootenay National Park, Yoho National Park, Mount Robson Provincial Park, Mount Assiniboine Provincial Park, Hamber Provincial Park)
- Ninstints Village (SGaang Gwaii) in Gwaii Haanas National Park Reserve
- the complex of Kluane National Park, Wrangell-St. Elias and Glacier Bay National Parks and Tatshenshini—Alsek Provincial Parks

What About Oceans, Lakes and Coastlines?

The federal government is responsible for the marine environment in all provinces and territories. Until recently, Canada had no comprehensive program for protecting marine regions. However, a national marine parks policy was approved in 1986 and, in 1994, the National Marine Conservation Areas Policy was adopted. This divides Canada's vast marine environments of the Pacific, Arctic and Atlantic oceans, as well as the Great Lakes, into 29 marine regions. The government's long-term goal is to have a marine conservation area in each of the 29 regions nationwide. Five marine regions have been identified along the coast of B.C., an area that supports the richest diversity of marine life in the entire country. These areas are: Hecate Strait, Queen Charlotte Islands Shelf, Queen

Charlotte Sound, Vancouver Island Shelf, and Strait of Georgia. For more information on marine conservation areas, see Appendix 4—*Resources Section.*

5. What Happens Next: Stewardship of Protected Areas

> *It is not enough to have sound conservation practices on exploited lands without a network of protected areas; nor is it good enough to focus on creating parks and wilderness areas and allow the rest of the landscape to be exploited.*
>
> Kevin McNamee, Canadian Nature Federation (1992)

The B.C. Protected Areas Strategy started with identification of protection needs, followed by selection of candidate sites on public lands, and then designation of protected areas. Now that the designation is nearly complete, the focus is on sustaining provincial protected areas through strategies that:

- develop closer bonds between communities and their protected areas;
- strengthen ecological stewardship;
- provide recreational opportunities for local residents and tourists; and
- include ways to involve youth in park stewardship.

Protected areas in public lands alone cannot maintain the diversity of species that live in British Columbia. Protected areas on *private land* are also needed, because protection involves caring not only for the lands and waters inside parks and wilderness reserves, but for the total environment of which they are a part. All living things depend on a healthy environment. In private lands, we can use methods such as conservation covenants, development guidelines, bylaws and other tools to protect sensitive areas such as fish and wildlife habitat.

Today, provincial protected areas are contained within a larger, integrated system of land use in which both public and private lands play key roles. This integrated system entails a broader management perspective that also takes into account what happens on neighbouring lands. Together, strategies for both public and private land are aimed at long-term stewardship of protected areas into the future.

What About Public Involvement?

The public can participate in discussions concerning protected areas through events sponsored by government agencies, First Nations and other non-governmental organizations and groups, or by contacting regional representatives. By communicating their concerns to decision makers, the public can play a major role in deciding how individual protected areas should be managed. Refer to Appendix 4—*Resources Section* for information and contact addresses.

1.
What Does Protection Mean?

What Does Protection Mean?

In *everything* we do, we are leaving a legacy for the future. When we decide to protect something—whether it be hockey cards or a stand of trees, we are saying, "this is valuable." When we do not make efforts to protect something, we are saying, "this is less important to us than other things."

Our heritage is what has been protected for us: from silverware to a family story, museum treasures to special holiday traditions, our grandmother's carefully tended garden to wilderness parks. Our choices today determine what our grandchildren will inherit.

In becoming more aware of the impact of our actions, we can better make responsible decisions. The following activities provoke students to analyze their values and the significance of some of the choices they (and we) all make. The exercises help students realize that protection begins at home.

- *In Choices – A Fiery Guided Imagery*, students imagine a crisis situation in which they must quickly choose an item to protect, and afterward reflect on how their values affect their choices.
- *Protection Webs* brings students together in groups to brainstorm the connections between the 'how, what, and why' of protection.
- *Family Treasures Go Time Travelling* gives students an opportunity to interview relatives, discover a family treasure, and imagine ways to protect that treasure in a time capsule.
- For a field trip and hands-on visit to a local site, *Protected Areas Around the Corner* enables students to do research, collect data, and explore the community values associated with that protected area.
- The final activity, *Park Connections: Introducing Your Local Protected Area* introduces students to a local protected area by having a guest speaker, such as a park ranger or volunteer, visit the classroom.

Activities in this section that can be used with the information from local case studies are *Protected Areas Around the Corner* and *Park Connection: Introducing Your Local Protected Area*. See the specific activity for a description of how to incorporate your local area.

1-1. Choices – A Fiery Guided Imagery

Activity Summary

Using a guided imagery of an imaginary crisis situation, students will learn about material and non-material things that have personal meaning.

Learning Outcomes

It is expected that students will:

- describe objects that have personal meaning for them;
- recognize that other students may value different objects; and
- demonstrate an appreciation of the impact of decisions that they have made.

Key Concepts

- We protect things that are valuable to us. Our heritage and culture influence our values.

Key Terms

Heritage • Culture • Protection

Materials

Journals and pens

Connections

Project WILD

- See section on *Hints For Using Guided Imagery*,

Time

Preparation: 5 - 15 minutes

Activity: 1 period

Background

In this activity, students will discover that protection involves decisions and making difficult choices. People usually protect items, both material (such as a ring or book) and non-material (such as a view or clean air) based on their values. Sometimes it is not possible to protect all valued items, and a decision must then be made as to which items receive protection and which do not. Students will be able to reflect on how their values affect their choices.

Let's Begin!

1. Prior to reading the following script, have students get their journals and pens ready. Darken the classroom as best you can. Have students be aware of how they are sitting and give them time to get comfortable with their eyes closed and their heads on their desks. Tell them you are about to read a story of a crisis situation.

Read in a calm, relaxed voice, pausing often.

Try to imagine the things I am about to describe. I won't put in all the details, so you must try to see and feel as clearly as you can the things I describe. Listen for a moment to the sounds you hear around you.

Imagine that you are walking into your kitchen. Look around, see the colours of the walls and floor. Sit down for a moment. Notice what surrounds you. Does something make you smile? What is in the room? Imagine holding it in your hand. Is some of your family in the room? Look at them carefully.

Move into the living room. Sit down for a moment in your favourite chair. Look around at the scene. Look for details. Notice the furniture, pictures, books and ornaments. Do any of them stir up memories? Your pet, if you have one, is looking at you.

Now move into your bedroom. Lie on your bed and look at your room. Enjoy being there, feeling relaxed. Notice the ceiling, the colour of the walls. Notice your pictures, the things you have beside your bed, on your shelves. Where are these things from?

Suddenly you hear a loud knock at the door. Someone calls out, "A major fire is raging less than a kilometre away. Evacuate now!" You have thirty seconds to grab just three things. Open your eyes now, and write down what they are.

2. Allow students no more than a minute to record their three choices. Then ask them to get comfortable and close their eyes again for the rest of the story.

You are safe now, in your car with your family. You are driving down the highway, away from the fire. The road is jammed with traffic. An officer is directing all cars to the side of the road. You hear the instructions, "All private vehicles must be abandoned. Everyone board the rescue bus." You have time to grab one of your things. Open your eyes now and circle your choice.

Assure students that everyone has been safely evacuated from the fire.

Extension

Students can **describe** the major fire scenario to family members or friends to find out what others might choose. Back in class, **compare findings** and talk about reasons for the different priorities and values.

3. Have students describe their choices with a partner and discuss these questions:

What are some of the reasons for your choices? In what ways was it difficult to choose? What do your choices tell you about yourself? How do you feel about what you couldn't choose? With more time to think about it, would you have chosen differently?

4. To complete this activity, have students write in their journals about what objects they chose to bring with them and why. Students can fill the following sentence:

I protected my _____ *because* _____.

1-2. Protection Webs

Activity Summary

Using cooperative group work, students create webs which help to assess what students know about protection, illustrate connections between what students protect and why. This activity also promotes reflection.

Learning Outcomes

It is expected that students will:

- list reasons for protecting certain things like a treasured ring or natural area;
- understand the definition of protection; and
- assess the relationship between cultures, their environments, and protection.

Key Concepts

- We protect things that are valuable to us. Our heritage and culture influence our values.

Key Terms

Protection • Natural Areas • Costs of Protection

Materials

Blackboard and chalk

Chart paper and pens

Appendix 10 – Reasons to Protect Natural Areas

Time

Preparation: 5-15 minutes

Activity: 1 period

Background

The reason people protect any material or non-material item is because that item is of value. Values are not always consistent from one person to the next, and within a community that is culturally diverse, there may exist many different values. While these values may differ, they are always based on the perceived significance of that item. For example, while one person may not value a hockey star's rookie card, a collector would gladly pay to add this card to his collection. In other situations, two individuals may value the same item for entirely different reasons and based on different values. For example, a landowner may value a property for its location and view of the ocean, whereas a biologist may value that same property for the ecological significance of a wetland located

within its boundaries. This activity will create an opportunity for the teacher and students to assess what students know about protection, explore the role of values, and encourage students to reflect on what they would protect and what their culture protects.

Let's Begin!

1. Review brainstorm etiquette: a free flow of ideas, no evaluation or criticism. Divide students into groups, with each group selecting a recorder, leader, and encourager for brainstorming.
2. Ask students to brainstorm this question: How is deciding to protect a natural area like putting a treasured ring in a safe (or your best hockey cards in plastic sheets)? Students can make a web flowchart to illustrate the connections. Have groups compare their ideas.
3. Now ask students to brainstorm these related topics:
   - What is protection?
   - What do we protect personally or as a culture?
   - How do we protect things, individually or collectively?
   - Why do we protect things?
   - What are the costs of protection?

   Encourage them to think about what they personally protect, and what we protect as a culture.
4. Have groups share their ideas with the class. Then compare the students' ideas with those listed in *Appendix 7 – Reasons to Protect Natural Areas*. Look for similarities and differences in the lists. Discuss any 'reasons to protect' from the guide that weren't suggested by students.

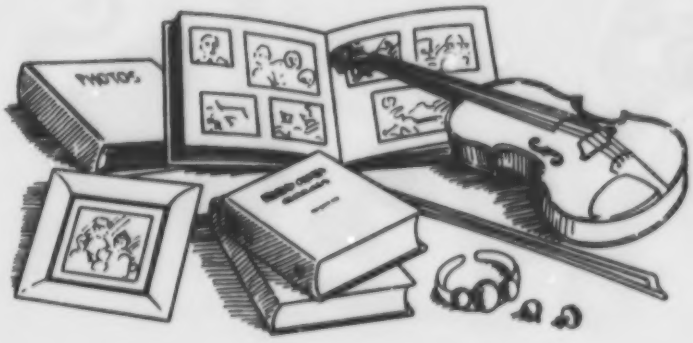
Journalling

- Brainstorm a list of cultural and religious traditions in your community, and choose one to study.
- Find out what is valued in your chosen group, and why.

1-3. Family Treasures Go Time Travelling

Activity Summary

In this activity, students brainstorm what family treasures they might like to protect, and then interview different family members or people in their immediate community to discover family or community values and treasured items. After choosing one treasured item for protection, students are challenged to find ways to protect and preserve their treasure in a time capsule.



Learning Outcomes

It is expected that students will:

- identify objects or places that are special to them;
- locate and record information from family or other sources using questioning and interviewing skills;
- evaluate personal decisions they have made in selecting their treasure; and
- express their thoughts, ideas or feelings about their treasures using oral and written communication.

Key Concepts

- We protect things that are valuable to us. Our heritage and culture influence our values.

Key Terms

Heritage • Culture • Material and Non-material possessions

Materials

Paper and pens

Journals

Student interview worksheet (teacher prepare)

Connections:

Backyard Biodiversity and Beyond

- Biodiversity Stories from the Family (1-4)

Time

Preparation: 30 minutes to prepare student worksheet

Activity: 1 period plus out of class time

Background

Deciding what "treasures" to protect requires choosing certain things from a selection of many alternatives. To make these decisions, we need to explore what values exist within the community and what they would like to see protected.

Let's Begin!

1. Tell students they have a once-in-a-lifetime opportunity to choose one thing to place in a time capsule that will not be opened for seven generations, around 200 years. It is no ordinary time capsule; it can contain anything from a story to a wilderness area, so long as it is a family treasure.
2. Brainstorm what a family treasure might be: a work of art, book, photograph, piece of furniture, item of jewelry or special clothing. Their treasures might be something they do not own, such as a favourite family place to visit. They might be non-material: for example, the description of a celebration, the memory of a special family camping trip, or a favourite song or story. Ask students to consider what it costs to protect these treasures, and what they may have had to give up to do so. For example, storing a ring in a safety deposit box means it is protected, but no one can wear it.
3. Brainstorm a list of questions students could ask their families about their selected treasures. For example, they might ask how long something has been in the family, how many times the family has visited that place, or who first told that favourite story. Have students record their questions in their journals, then transfer selected questions to the student worksheet.
4. Ask students to interview their family members about the treasures using the worksheet, and to ask permission to bring the treasures (or pictures or descriptions) to class. Limit the number of treasures per student to 2-3 items.
5. In small groups, ask students to discuss why they have chosen their treasures, what significance they have for their families, and anything else they have learned.
6. Challenge students to design a way to preserve their treasures in the time capsule. Students who have chosen a place for their treasure will have to use their imaginations—but perhaps they can preserve "essence of place" in a poem! Encourage students to think about what each item may need protection from (for example, a photograph may need protection from moisture, heat, and fingerprints; a watch may need protection from moisture and handling; some cotton lace may need protection from exposure to sunlight, moisture and moths; a story, from fading memories; a place, from other people).

Tiger Lily

Journalling

Imagine that 200 years from now a person your age opens the time capsule. Write a letter to that person explaining your choices.

1-4. Protected Areas Around the Corner

Activity Summary

Students take a field trip to a local protected area, collect, record, and analyze data, and present their findings.

Learning Outcomes

It is expected that students will:

- identify protected areas in the local environment (including natural areas/ resources, cultural or heritage sites) using research, mapping, and interviewing skills;
- use a variety of ways to collect and record data;
- explain ways that people preserve or protect these areas; and
- organize and present their findings using oral and written communication skills.

Key Concepts

- Protected natural areas are important for many reasons. They provide ecological, scientific, spiritual, cultural, recreational and economic benefits.
- Protection is an ongoing and complicated process which has both costs and benefits. Successful protection depends on the commitment of everyone involved.

Key Terms

Protected Area • Heritage Site • Cultural Site • Cost vs. Benefit

Materials

Map of your community (use Chamber of Commerce, BC Parks, municipal or other local map)

Journals and pens

Student worksheet

Time

Preparation: 30 minutes to 1 hour to locate maps, create student worksheet, letter to parents, and plan field trip.

Activity: 1 period prior to field trip; field trip (time will depend on site selected); 1 period post trip.

Background

As students study their community map, they will find many examples of protection. Visiting the areas will increase their knowledge and may lead to active involvement.

Connections:

Project WILD

- See *Guidelines For Interviewing People*, Appendix

Improving Wildlife Habitat in the Community, p. 348

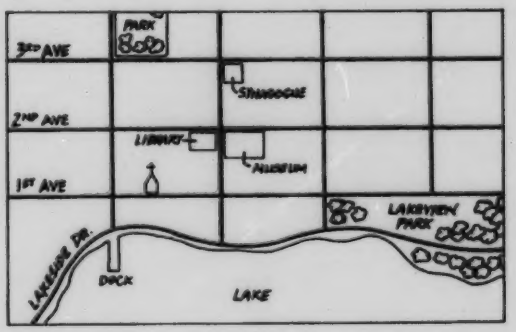
Keeping Space, p. 303
What's That Habitat, p. 36

Backyard Biodiversity and Beyond

- Interview a Biodiversity Hero/ Heroine (4-15)

Protected areas they are likely to find may include some of the following:

- museums where artifacts from the past are stored and displayed;
- archives where stories and records are filed;
- heritage buildings where styles of architecture are preserved;
- graveyards and monuments where people and events from the past are honoured and remembered;
- libraries where books are carefully catalogued and shelved;
- nature sanctuaries and parks where habitat for animals and plants is protected;
- national parks and historic sites—check Appendix 7;
- environmentally sensitive areas; or
- other areas (see Appendix 13)



Students might also notice areas that are not currently protected but which they feel would benefit from protection.

Let's Begin!

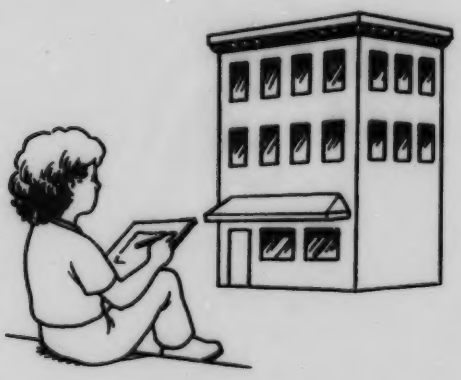
1. As a class, brainstorm as many different kinds of protected areas that might be found in their community. If some students show little interest in areas that are currently protected, talk about areas or things which they think would benefit from protection. Using the list the students' generated, locate all of these on the community map.
2. In groups of two or three, ask students to select a site to learn about. Try to ensure that a range of areas is researched.
3. Discuss different ways the research can be conducted. This might include making observations, interviewing people, reading newspaper clippings, pamphlets or historical records, and studying photographs and memorabilia. Ask each group to brainstorm a resource list of places and people in their community that might be able to help them answer the following questions:
   - What is protected here?
   - Why is it protected?
   - Who or what is it protected from?
   - How is this place protected?
   - What are the costs (monetary and other) of protecting this place?

- What are the costs (monetary and other) of not protecting this place?

4. On the field trip day, visit the site and have students record their data using the student worksheet. In addition, have them include quick sketches, rubbings, photographs, and/or journalistic note-taking. Ask them to take their journals and write about:
   - what they see, hear, feel and/or smell at the site
   - how they feel visiting the site
5. Back in class, ask students to present their findings. The conversation might center around what surprised them most at the site they visited. Challenge them to discuss the questions listed above in Question 3.
6. Ask the groups to write a short sentence or poem (such as a haiku) which sums up what they learned about the site they visited. Attach these word-pictures to the community map to create a *Community Celebration Collage*. Further embellish the map with *representative* mementos, such as one of their sketches, rubbings or photographs, or something students make or find at their sites.

Journalling

Things we protect may or may not have monetary value. What kind of value(s) are being protected at the site you visited?



1-5. Park Connections: Introducing Your Local Protected Area

Activity Summary

Students will be introduced to a local protected area such as a provincial, national, regional, or municipal park using local resource people and other materials. This activity provides students an opportunity to develop questioning skills, and to gain a better understanding of their local protected areas.

Learning Outcomes

It is expected that students will:

- locate on a map and describe a local park or protected area;
- understand the variety of tasks that people do to protect natural areas;
- assess the relationship that exists between local cultures and their environments; and
- develop questions to further their understanding of their local protected area.

Key Concepts

- Protected natural areas are important for many reasons. They provide ecological, scientific, spiritual, cultural, recreational and economic benefits.
- We protect things that are valuable to us. Our heritage and culture influence our values.

Key Terms

Provincial Park • Municipal Park • Greenway • Protected Areas

Materials

Maps and brochures of your local park or protected area

Park or municipal visitor (Contact your local BC Parks District Office, National or Regional Parks, or local Municipal Hall)

Slide projector (if needed)

Time

Preparation: 30 minutes to organize visit. Encourage guest speakers to bring photos, slides or other props.

Activity: 1 period

Background

Invite a park ranger, volunteer, or municipal park worker from a local protected area to visit your classroom. Students can learn a wealth of information about protected areas by meeting with someone who works there, whether it be a volunteer from a stewardship group or a park ranger. Ask your guest speaker to tell the students about the history of that area, and what events led to its protection. Additionally, students may become enthusiastic about the methods and actions taken to protect special areas, and be motivated to consider that as a career direction.

Let's Begin!

1. Provide a brief introduction to the students about the guest speaker you have arranged, and the protected area they are representing. Encourage students to keep certain questions in mind for your speaker, such as:
   - Why is this area protected?
   - What does the guest speaker do in this park or area to protect it?
   - What groups, community or cultural organizations are active in this park or protected area?
   - What skills does the guest speaker need in his/her work, and what experiences led them to get involved with the park?
   - What actions can the students take to contribute to the protection of the area?
2. Allow most of the period for discussion between students and the speaker. Leave 5 to 10 minutes for a discussion between students after the speaker has departed. Encourage students to reflect upon what new information they have learned. Have their opinions of how to protect local areas changed? How do their thoughts and opinions compare with those of the speaker and other classmates?

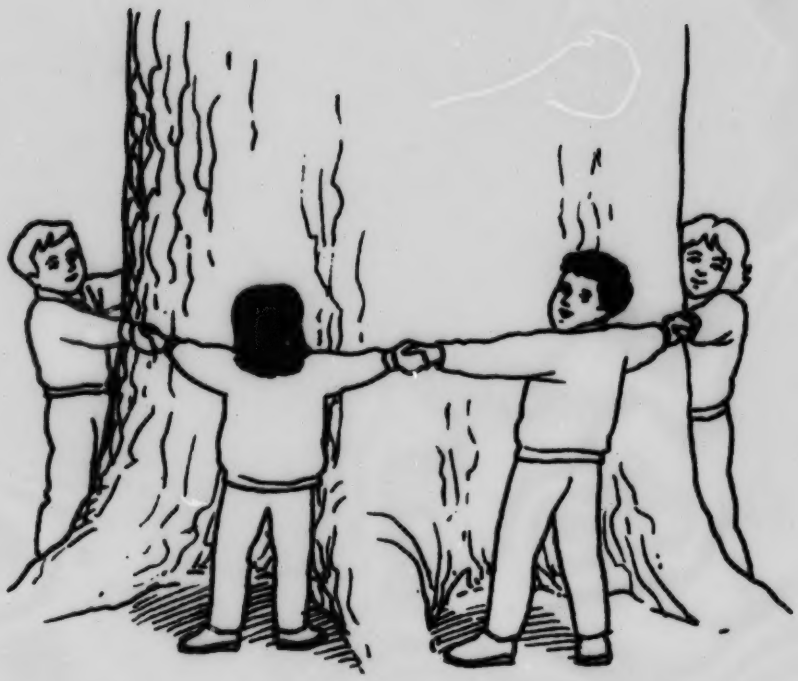
Journalling

1. What skills do you have that can be used to protect areas? Would you like a career protecting valuable areas? What skills or experience do you need that could assist you?
2. Protecting an area can have effects on both that area and the community. How is your community affected by your local protected area, and do community members impact that area in return?

Extension

Celebrate your protected area! Have groups of students make posters describing the protected area and why it is a special place. Try to include pictures, drawings, poems or songs that help to describe that area. Mount these posters in a community centre or shopping mall.

2.
Why Do We Protect?



Why Do We Protect?

What are some of the costs and benefits?

If your class brainstormed *Protection Webs* or explored *Protected Areas Around the Corner*, they have thought about some of the many reasons we decide to protect things. Their value to us may be aesthetic, economic, historic, educational or environmental (see Appendix 7—*Reasons to Protect Natural Areas* for examples). But ultimately, how we choose depends on what is important, necessary or valuable to us.

When we choose to protect something, there are always costs involved. Sometimes these costs are physical. For example, deciding to keep an expensive family heirloom ring may mean giving up other things. Deciding to protect a large black walnut tree in your yard means having to accept the shade it will cast on the vegetable garden. Costs are also measured in limited use or access, such as not being able to play with the china doll displayed on the mantelpiece or bike ride in the nature preserve.

Sometimes it can be difficult to predict the consequences of our choices. For example, in a small town in New York State, people used large amounts of powerful pesticides to protect their gardens and parks from insect pests. Local birds, mice and other animals died from eating the sprayed insects. Several family pets died from eating the dead animals. Pesticides wound up in the town water supply, making it undrinkable for several months and poisoning the trout population, which sustained the town's tourism industry. The next season, damage to the plants was worse than before spraying, for without the natural predators around to eat the insect pests, they multiplied.

The activities in this section explore the "whys" of protecting natural areas.

- *Who Lives Here?* involves students in a hands-on exploration of a natural area and provides an opportunity to think about why plants and animals might need protected areas.
- *My Special Place* offers students an experience of the aesthetic and spiritual reasons for protecting natural areas.
- Knowing *What Your Community Thinks* gives insight into the multitude of reasons people may or may not want natural areas to be protected.
- *Exploring Our Different Values* gives students an opportunity to think over their priorities and to consider some costs and benefits of the choices they make.

Activities in this section that could be used with the information from BC Parks local case studies are *My Special Place, Who Lives Here?* and *What Does Your Community Think*. See the specific activity for a description of how to incorporate your local area.

2-1. My Special Place

Activity Summary

Students choose and explore a natural special place in a park or other protected area to reflect on its importance and to discover their own connections with nature.

Learning Outcomes

It is expected that students will:

- describe living resources in the local environment around them with descriptors such as *colours, shapes, smells, textures, sounds, temperatures, and communities;*
- compare written prose to the natural environment they are visiting; and
- create a poem, verse or journal entry on their "special place" in that park or natural area.

Connections

Project WILD

- Wild Words . . . A Journal-Making Activity, p. 82
- Can Do!, p. 345
- Learning to Look, Looking to See, p. 280

Backyard Biodiversity and Beyond

- Family Memories (4-10)

Key Concepts

- We protect things that are valuable to us. Our heritage and culture influence our values.
- Protected natural areas are important for many reasons. They provide ecological, scientific, spiritual, cultural, recreational, and economic benefits.

Key Terms

Conservation Ethic • Biotic Communities • Communities

Materials

- student journals
- pens, coloured pencils
- photocopies of the quotations (p. 28)
- a natural area such as a park
- blindfolds or scarves and a long piece of rope (optional)

Time

Preparation: 15 – 30 minutes to choose natural area to visit and photocopy/cut-out quotations

Activity: 1 period outdoors

Background

Parks and natural areas are a valued element of any community. We can expect that in a diverse community, a natural area may be valued for

numerous reasons, all of which may be entirely different. A local park may represent a favorite reading spot for one person, a recreation field for another, or an early morning bird watching location for someone else. By visiting a local park or natural area students can spend some quiet time reflecting, observing and describing living resources. Through this process, connections are made with protected areas and why they might be valued.

Let's Begin!

Prior to the field trip

1. Write "Leave Nothing But Footprints, Take Nothing But Memories" on the board. Discuss the statement with your class and invite them to write and illustrate their own conservation ethic in their journals. Other examples to share might include the following quotes:

We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect. Aldo Leopold, *A Sand County Almanac*

A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise. Aldo Leopold, *A Sand County Almanac*

The main ingredients of an environmental ethic are caring about the planet and all of its inhabitants, allowing unselfishness to control the immediate self-interest that harms others, and living each day so as to leave the lightest possible footprints on the planet. Robert Cahn, *Footprints on the Planet*

2. Explain the purpose of the field trip and have students write the following words in their journals, as clues for what to look for in their special places: *colours, shapes, smells, textures, sounds, temperatures, communities.* They should record these questions on another journal page: *How does this spot remind you of past moments or places you have been? What does it tell you about yourself?*

In the Field

3. Take the class to a natural area: a park is ideal, although a non-paved portion of the schoolyard can work if necessary. Have some high-energy activities planned beforehand to use up some of the students' excess energy! Then, calm things down by leading them in a few slow, deep breaths. Continue with you leading them quietly around the area, single file, to observe the boundaries of the activity area; or do the following:

4. *(Optional)* One way to further attune students to nature and to themselves is by creating a blindfold chain. Have students blindfold one another and then hang on to the rope. Take your position at the front of the rope, and ensure that the person at the end of the rope is not blindfolded either. Ask them to walk in silence (for a more magical experience) as you lead them slowly and carefully around the area. In an open area, ask them to sit down and remove their blindfolds.
5. Tell them you will be asking them to look for a spot or an object that is particularly beautiful, meaningful or enticing to them. For example, they may feel drawn to an old tree, a brightly coloured flower, or a shady riverbank.
6. Before seeking their spots, work together to establish some easy to see personal boundaries. Insist that they give one another space (at least a few metres between students is preferable) and remain silent.
7. As students find and move to their spots, pass out their journals. Give students at least 15 minutes to think over the questions and clues they have written in their journals (step 2 above). Then pass to each student a copy of one of the quotes on the following/facing page. Ask them to contemplate the words and write some of their own.

Journalling:

In some cultures, it is not necessary to create parks to protect nature. Why might that be? Write a story or draw a picture which tells about day-to-day life in an imaginary culture where parks are not necessary.

To The Teacher

- Please make enough photocopies of the quotations on this page so that each student can have one quotation.
- Cut along lines.

The best and most beautiful things in the world cannot be seen or even touched. They must be felt with the heart. Helen Keller

Generations come and generations go, but the Earth remains forever. Ecclesiastes 1:4

My heart is tuned to the quietness that the stillness of nature inspires.
Hazrat Inayat Khan,
Nature Meditations

With beauty before me,
May I walk
With beauty behind me,
May I walk
With beauty above me,
May I walk
With beauty below me,
May I walk
With beauty all around me,
May I walk
Wandering on a trail of beauty,
Lively, I walk.
Navajo Indian Chant

Wonderful how completely
everything in wild
nature fits into us, as if truly part
and parent of us. The
sun shines not on us, but in us. The
rivers flow not past,
but through us, thrilling, tingling,
vibrating every fibre
and cell of the substance of our
bodies, making them glide and sing.
John Muir
Mountain Thoughts: The Sierra

The Birds of the Air

The birds of the air are my brothers,
All flowers my sisters,
The trees are my friends.
All living creatures,
Mountains and streams,
I take unto my care.
For this green earth is our mother,
Hidden in the sky is
the Spirit above.
I share one life with all who are here;
To everyone I give my love,
To everyone I give my love.
Joseph Cornell
Listening to Nature

2-2. Who Lives Here? A Habitat Study

Activity Summary

In this exercise, students model wildlife and vegetation studies by mapping the habitats they survey, learn what comprises an organism's habitat, and make some decisions about habitat protection.

Learning Outcomes

It is expected that the students will:

- use a variety of methods to collect and record data that describes habitats found in a park or school yard; and
- analyze the data to compare habitats and locate them on a simple map.

Key Concepts

- Protected natural areas are important for many reasons. They provide ecological, scientific, spiritual, cultural, recreational, and economic benefits.
- Many protected areas are islands of natural habitat surrounded by human development. To sustain them, we need to make management decisions based on knowledge of the local environment.

Key Terms

Habitat • Organism • Local Plants and Animals

Materials

- a selection of tools for exploring the area, such as: trowels, buckets, plastic jars, spoons, hand lenses, binoculars, small collecting nets, bug jars
- various field guides, clipboards and/or journals, pens/pencils, Habitat Data Sheets (p. 35), rough map of the area
- BC Parks Local Case Study (optional) for information about local plants and animals

Time

Preparation: 30 minutes to 1 hour to organize equipment, data sheets, and parent volunteers if leaving schoolyard.

Activity: 1 period to familiarize students with study method and local plants, animals, and habitats

1-2 periods outdoors

1 period for post field trip discussions

Connections

Project WILD

- Urban Nature Search, p. 127
- Microtrek Scavenger Hunt, p. 20
- Fishy Who's Who, p. 195
- A Guide to the Ecosystem Concept, p. 439
- Animal Poetry, p. 85
- Improving Habitat in the Community, p. 348
- My Kingdom for a Shelter, p. 44
- Micro Odyssey, p. 165

Backyard Biodiversity and Beyond

- Be a Biodiversity Detective! (2-5)
- Biodiversity Means Differences (2-11)

Background

A plant or animal's home is its habitat. This is where it finds the food, water, shelter and space needed for survival. The size of a habitat varies widely, from an entire forest to a pond to the intestine of a termite! Within any area there may be many habitats, all slightly different from one another. For example, a hole in a tree trunk or an animal carcass are habitats within a forest.

Habitats in the schoolyard may include a patch of grass, a tree canopy or a rock outcropping. At a beach, there may be a rotting log, a small pool of water, and a clump of seaweed all providing habitat for certain plants and animals. Habitats, just like our homes and communities, are not static places, and are always changing. For example, a salmon stream is affected by how the watershed is managed upstream (or downstream in the case of dam construction). Humans have choices in how we impact or influence the world's habitats.

Protecting plants and animals is one of the criteria for selecting areas for protection in British Columbia. Knowing where different plants and animals live and identifying their habitats helps in the decision-making process of selecting what areas need protection.

Let's Begin!

Prior to the field trip:

Write "Leave Nothing But Footprints, Take Nothing But Memories" on the board. Discuss the statement with your class and invite them to write and illustrate their own conservation ethic in their journals (see examples of quotes in Activity 2-1, "Let's Begin!" on p. 29).

In the Field

1. Bring the class outside—at least as far as the schoolyard, but preferably to the local park or protected area that you were introduced to in Activity 1-5.
2. Working in small groups, have students look for three different habitats and record their findings on the "Habitat Data Sheet." The equipment they need will depend on the site; see Materials (p. 32) for suggestions.
3. Gather the groups to review their discoveries. Discussion might include:
   - how many different habitats were found?
   - what are some of their significant differences?
   - what are some ways they can be damaged or destroyed by careless people?

- are any of these habitats in danger of disappearing? Why?
- in what ways might these habitats be protected, restored or enhanced?

4. Plot the habitats on a map of the area explored (See BC Parks Local Case Study, or obtain brochure maps if available from local parks department, or draw a rough diagram).
   - how many grassy meadows, rotting logs, tide pools, etc. did the class discover? Categorize the types and numbers of habitats.
5. As a class, discuss how knowledge about habitat might help decision makers choose which areas to protect. For example, if students find there are several grassy meadows but only one pond, the pond might be chosen to be protected. Or, if students find that a certain meadow has an unusually large variety of insects, they might decide it warrants protection.

Great Blue Heron

Journalling

1. Habitat is where an organism finds its food, water, shelter and space. Most humans use resources far beyond the boundaries of our "habitats."

   Where does your food and water come from? Check out your shopping list.

   You may want to refer to a globe or world atlas in thinking about what habitats many of the things come from that you and your family buy.
2. Protecting habitat for wildlife is one reason for establishing parks and other protected areas. What are some other reasons?

Habitat Data Sheet

Use words or pictures to fill in blanks. If you don't know the name, describe what you see.

Date _____

Name _____

1. Habitat name and description:

2. Plants you find here:

3. Birds or mammals, or their signs, that you see here:

4. Insects you see:

5. What else might live in this habitat?

6. Why would an animal or plant live in this habitat?

7. What are the signs of human influence?

8. Why would you choose to protect this habitat?

NOW! Use the reverse side to roughly sketch the location of your habitat in the area you are visiting.

2-3. Exploring Our Different Values

Activity Summary

Students rank the importance of things from a number of perspectives and, in doing so, explore personal and group values using critical thinking and decision-making skills.

Learning Outcomes

It is expected that the students will:

- be able to examine their own values and beliefs relating to social, cultural, and environmental values;
- demonstrate an appreciation for the impact of the decisions they have made in ranking their choices; and
- describe the known and potential environmental impacts of using natural resources.

Connections

Project WILD

- Flip the Switch for Wildlife!, p. 337
- What Did Your Lunch Cost Wildlife?, p. 335
- Ethi-Reasoning, p. 340

Key Concepts

- We protect things that are valuable to us. Our heritage and culture influence our values.
- Protection is an ongoing and complicated process that has both costs and benefits.

Key Terms

Native Plants • Environmental Values • Perspective • Extinction

Materials

Journals and pens

Time

Preparation: 5 to 15 minutes

Activity: 1 period

Background

Life is full of choices. Choosing one thing can often mean giving up something else. By protecting a natural area, we may not have a housing development where people could live, or a factory or logging region where people could work. It may also mean giving up activities such as hunting, trapping, fishing or plant harvesting. Yet, if we do not protect natural areas, plants and wildlife disappear and may even go extinct. We may also lose opportunities for tourism and recreation. Decisions about protection are as complex as the society in which we live, because people have many different wants and needs.

Let's Begin!

Students do this ranking exercise first as themselves, then from two other perspectives, and then compare their thoughts.

a) The List (See Student Worksheet)

- a large home
- wilderness parks
- a marsh
- a shopping mall
- land for food crops
- native plants
- a school
- a forest
- a highway
- a tree farm
- a lake
- wild animals
- grazing land

b) The Perspectives

1. *Round one:* imagine that these elements are all part of the region where you live. Which is most important? Ask students to rank the list, and record their choices in the first column. Divide students into groups of 2 or 3 to compare and discuss their choices.
2. *Round two:* ask students to choose a favourite animal or plant that is native to British Columbia, and speaking for their plant or animal, rank the list once again. If time permits, they could make a simple paper mask of that animal, to help them stay in character. Again, divide the students into groups of 2 or 3 to compare and discuss their choices.
3. *Round three:* ask students to imagine that they have to make a living from the region, and speaking as that worker, rank the list once more. Again, finding or making a simple prop to represent a character (such as a mill worker, tour guide, trapper, housing developer, store owner, etc.) may help them focus on their character as they rank the items on the list. Divide students into groups of 2 or 3 to compare and discuss their choices.
4. As a class, compare results from the various groups. Discussion may revolve around some of the following questions:
   - Do most students agree on their number one choice for the different perspectives? What are some notable differences between the three situations?
   - For which case was it most difficult to do the ranking? Why?
   - What were some of your considerations as you ranked the list?
   - Were future generations considered in any of the rankings? Why or why not?
   - What kind of costs and benefits are associated with some of

Let's Begin! (continued)

your choices? For example, how does choosing a shopping mall over a marsh affect the marsh? Or choosing a marsh over a large home or a highway affect people's lifestyles? Can we have both? Which would you choose?

Journalling

1. Did you understand your own priorities when you responded as yourself? If you were to do the ranking again now, would you rank things differently?
2. Discuss the *environmental costs* of some of your everyday activities in small groups. For example:

   What is the difference between:

   - using batteries instead of an adapter for a computer game?
   - using paper or plastic instead of cloth lunch bags?
   - eating a roast beef sandwich instead of a tomato sandwich?

   What are the costs of a park?

   - An old-growth forest may be worth millions of dollars as lumber when clear-cut, but will take hundreds of years for it to grow back to a similar state. What are some of its other values?
3. What are the benefits of a protected area such as a park? Consider your answer from your own point of view, as well as that of a bird or animal.
4. Make a list of the costs and benefits of having a park (question 2 & 3) or protected area. Comparing costs and benefits helps decision-makers to make more responsible decisions. Try to include as many different perspectives in your cost and benefit list as you can (consider humans, animals and plants). Compare the two lists. Can you see any difficulties in making decisions about protecting lands and parks?

STUDENT WORKSHEET - Exploring Our Different Values

Imagine that these different things are all part of the region where you live. Which is most important?

First, rank the first column from your point of view as a student (from 1 –13, with 1 being most important, 13 the least important). Discuss and compare your list in small groups.

Next, imagine you are your favorite plant or animal, and rank the list again for what you feel is most important. How does this new ranking compare to your 'Student' list?

Finally, rank the elements in the last column from the point of view of what you think a local natural resource worker might have, and compare this ranking to your others. What does this tell you about how points of view (and values) affect decisions?

STUDENT POINT OF VIEW		PLANT/ANIMAL POINT OF VIEW		NATURAL RESOURCE WORKER POINT OF VIEW	
Value	**Rank**	**Value**	**Rank**	**Value**	**Rank**
a large home		a large home		a large home	
a forest		a forest		a forest	
a wilderness park		a wilderness park		a wilderness park	
a highway		a highway		a highway	
a marsh		a marsh		a marsh	
a tree farm		a tree farm		a tree farm	
a shopping mall		a shopping mall		a shopping mall	
a lake		a lake		a lake	
land for food crops		land for food crops		land for food crops	
wild animals		wild animals		wild animals	
native plants		native plants		native plants	
grazing land		grazing land		grazing land	
a school		a school		a school	

2-4. What Does Your Community Think?

Activity Summary

Students brainstorm reasons to protect natural areas, design and administer a questionnaire, and gather and analyze information about the variety of opinions in their community about protected areas.

Learning Outcomes

It is expected that students will:

- formulate questions that are relevant to specific audiences and purposes, so as to learn the community perspectives towards protected areas;
- describe a variety of attitudes and perspectives about local protected areas; and
- demonstrate an awareness and respect for the opinions and attitudes of others towards protected areas.

Key Concepts

- We protect things that are valuable to us. Our heritage and culture influence our values.
- Protected natural areas are important for many reasons. They provide ecological, scientific, spiritual, cultural, recreational and economic benefits.

Key Terms

Park • Natural Area • Ecological Reserve • Wilderness Area • • Environmentally Sensitive Area

Materials

Paper, pens, journals, student questionnaire

Time

Preparation: 30 minutes – 1 hour

Activity: 2 periods plus out of class time

Background

Parks, and other protected areas, are created for a variety of social, political and economic reasons, in accordance with people's cultural beliefs and values. These reasons can change, depending on the time, place, and the people involved. Most people have strong opinions about protected areas: decision-makers must attempt to consider all sides and choose as best they can. Interviews and polls provide an organized way of assessing attitudes and knowledge about different issues.

Connections

Project WILD

- Guides to Interviewing People, p. 436
- Changing Attitudes, p. 257

Let's Begin!

1. Ask students about some of the parks, natural areas, or other protected areas they may have visited.
   - What did they see there?
   - What was special about them?

   Ask the class why it is important to have protected areas such as parks and ecological reserves set aside. With the class, try to categorize the different reasons given. You may wish to use the reasons listed in Appendix 7 as a guide. Keep a copy of the class reasons for future reference.

Black Bear

2. As a class or in small groups, have students develop a questionnaire on protected areas to use when interviewing people in the community.

   Students should decide:

   a) the purpose of the questionnaire (what do we want to find out?)
   b) the type of information that will fulfill that purpose (how can we find that out?)
   c) the questions (what questions will we ask?)

   Questions might include:
   - Have you visited a park or other protected area? Why did you go?
   - What did you do there? What did you like/dislike about it?
   - Why are parks and wilderness areas important?
   - Is there anything about parks and other protected areas that concerns you?

Tiger Lily

3. Make copies of the completed questionnaire. Students should practice introducing themselves and administering the questionnaire to one another.
4. Brainstorm a cross-section of people to interview. These may include:
   - a local store attendant,
   - a fisheries officer,
   - a mill worker,
   - a real estate salesperson,
   - someone at the Native Friendship Centre,
   - a teacher,
   - an artist, etc.

The family, neighbours and friends of students in the class will probably encompass a good cross-section of people. Divide the class into groups of three and have them decide which people they will be comfortable interviewing. Each group should interview at least three people. Students can take turns asking questions and writing notes.

5. In small groups, ask students to summarize and assess the interview data. Use the list in Appendix 7—*Reasons to Protect Natural Areas*—to categorize the data or have students generate their own categories. Ask students to discuss questions such as:
   - Did more people say they have visited a park than have not?
   - How does your group's data compare with other group's data?
   - Did you have any problems conducting the interviews? What were they?
   - In what ways do some of the answers surprise you?
   - What do people know about protected areas?
   - What concerns do people have about protected areas?
   - Are there interview questions you would change? Why or why not?
   - Do you feel the "results" of your questionnaire represent the variety of opinions in your community? Why or why not?

Journalling

1. Summarize what you have learned about the reasons we protect natural areas.
2. We may have to give up some of our comforts and luxuries to keep natural areas. Do you think the people you interviewed are willing to do that? Are you?
3. How does what the community thinks affect your own thinking?

3.
How Do We Decide What to Protect?

How Do We Decide What to Protect?

Did you try the *Fiery Guided Imagery* and the *Family Treasures* activities? They probably reminded your students how difficult it can be to prioritize things at the personal level. Did your class conduct interviews to find out *What Your Community Thinks* and notice big differences of opinion about parks and wilderness areas? In a society where people have so many different wishes and needs, coming to decisions about what to protect is downright challenging! Not only do we need to know what is available and how it can best be safeguarded, we also have to sort out our differences and try to reach agreement.

The exercises in this section explore the problem of how we decide what to protect, from two angles. The first aspect focuses on protected areas and is more technical: what is out there and how can we best protect it?

- The fun *Habitat Islands* deepens students' understanding of the basic needs of plants and animals.
- *Plants and Animals of Protected Areas* familiarizes students with the variety of ecosystems in British Columbia.

The second aspect is the social context: how can we best go about making a decision that everyone can live with?

- *Schoolyard Surveys* provides an arena where students practice choosing special areas to protect and developing arguments in favour of protection.
- For a more complete exercise, including activities involving mapping and role playing, we encourage you to do the Chilcotin Case Study, available on the Web at no cost, at *www.hctf.ca/wild/resources/protectedareas/protectedareas.htm*.

Activities in this section that could be used with the information from BC Parks local case studies are *Habitat Islands* and *Plants and Animals of Protected Areas*. See the specific activity for a description of how to incorporate your local area.

3-1. Habitat Islands

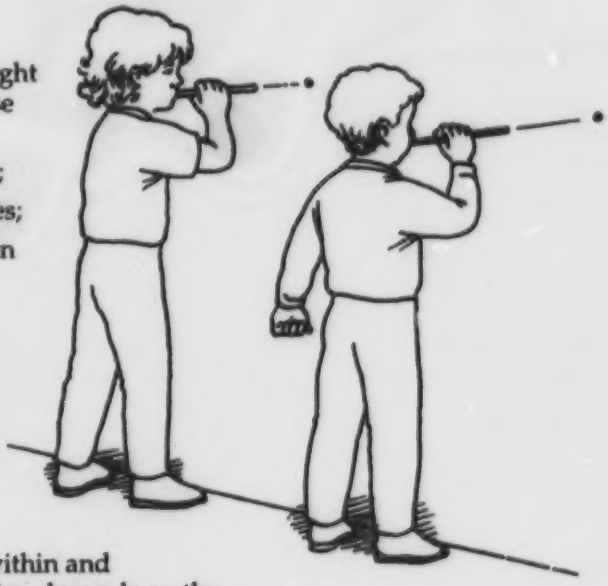
Activity Summary

Students simulate the process of species dispersal to explore the theory of habitat islands, make predictions about habitat island scenarios, record and analyze data, and create graphs.

Learning Outcomes

It is expected that students will:

- identify and test a prediction about what might happen when the "parents" begin to disperse their "offspring";
- use graphs to summarize experimental data;
- record and interpret data about survival rates;
- describe the influence of the size and location of protected habitat islands on species populations.



Key Concepts

- Many protected areas are islands of natural habitat surrounded by human development. To sustain them, we need to make management decisions based on knowledge of the local environment.
- Protected areas are affected by our actions within and beyond their boundaries. Successful protection depends on the commitment of everyone involved.

Key Terms

Habitat Islands • Species • Species Dispersal • Offspring •
• Source Habitats

Materials

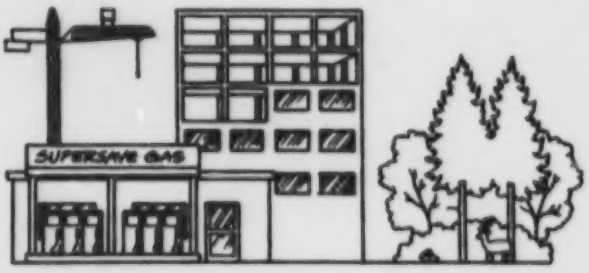
- several large sheets of flipchart paper for making the 'habitat islands" and paper cut-out to represent a storage warehouse for automotive parts, a new golf course, a large field of potatoes, a housing complex, and numerous highways and roads
- masking tape
- small pieces of paper, "tiddly-winks", beanbags, or pennies
- blackboard
- chalk
- local map with parks and protected areas identified

This activity can take place in the classroom (desks and chairs pushed to one side), gym or schoolyard.

Time

Preparation: 30 minutes - 1 hour

Activity: 2 - 3 periods



Background

A little over a century ago, most North Americans lived in small communities surrounded by wilderness. Since then, farming, forestry, roads and other human activities have dramatically altered the landscape. Where once there were continuous expanses of forest or prairie, there are now only isolated pockets of wild lands, sometimes preserved as wilderness parks and nature reserves. They have been called "habitat islands" surrounded by a "sea of human-altered landscape." Some researchers predict that within this decade, much of the world's natural areas will be confined to nature reserves and parks. But are these "islands," or areas of protected wilderness, able to support a variety of species and if so, for how long?

Connections:

Project WILD

- Migration Barriers, p. 293

Backyard Biodiversity and Beyond

- Endangered Species and Spaces of British Columbia (4-7)

Islands have two conflicting problems. On the one hand, island populations are often smaller than those on an adjoining mainland. In the case of "habitat islands," populations contained are small subsets of what they would be in a larger natural area. Small populations are at a much greater risk of disappearing through local extinction (extirpation) than are larger populations, so island populations are always at risk.

On the other hand, islands may be hard to get to for species that could colonize them. For example, there are many mountains on Vancouver Island that could, but don't, have our endangered Vancouver Island marmot. While other mountains (and mountains act as islands, surrounded as they are by valleys) might offer great habitat for the marmot, the marmot can't get to that habitat as they won't go down into the forests and valleys separating one mountain from another. So immigration to islands can be a problem.

The number of species on any island is a dynamic relationship between extinction and immigration, both of which are influenced by the island's size, and its distance from a source of new species.

Studies of the geography and biology of actual islands have led to a *theory of island biogeography*. The theory can be presented as a simple model that helps explain a very complex situation. In general, large islands have more species than smaller islands, and islands that are close to the mainland (or large habitat islands)

(cont'd)

have more species than remote islands. Of course, there are exceptions, but these general rules-of-thumb help planners make decisions about the size and location of protected areas, which are themselves "islands."

The question is further complicated by what is called "the edge effect." When the habitat around a protected area is changed, the edge of the protected area also changes. For example, if there is logging around a park, more sunlight reaches the edges, the water supply changes and so does the wind. Plants and animals suited to these new conditions can invade the area. The native plants and animals may experience more competition, or conditions are so changed that they cannot survive. Only the center of the protected area may continue to have suitable habitat, with the end result that the habitat island is even smaller than it appears on the map. Knowledge about the edge effect explains how our activities outside the boundaries of habitat islands and protected areas can impact the conditions and suitability for plants and wildlife within those areas.

Establishing buffer zones around protected areas is now being recommended. Human activity is allowed within the buffers, but is limited to activities that do not pose a threat to the adjacent protected area. As well, it is hoped that creating "corridors of protection" between protected areas will effectively enlarge protected habitats. The idea in this case is that plants and animals will disperse and travel from their original habitat islands (or "source habitats") along these natural pathways to find new resources or mates.

As the number of rare and endangered species increases, there is a profound sense of urgency to protect what remains. Even though it is a complex area of study, the theory of island biogeography can guide us in our efforts.

Let's Begin!

In this activity, students explore the relationships between size and location of habitat islands by tossing beans, rice, paper or pennies from a "source habitat" to a series of "habitat islands." The activity involves two challenges that are described on page 50. If time is limited, try the first only, but be sure to read "To Conclude" on page 51 for final instructions. You might want to consider using local plant or animal populations as your "parent" and "offspring". ***See BC Parks Case Studies for a source of information about local species nearby your school or community.*** Or, you can use the following list:

SPECIES AT RISK	Mammals	Birds	Reptiles & Amphibians
Some Endangered Canadian Species:	• bowhead whale • eastern cougar • Peary caribou • right whale	• Eskimo curlew • king rail • spotted owl • whooping crane	• blue racer snake • leatherback turtle
Endangered B.C. Species:	• Vancouver Island marmot • sea otter	• American white pelican • burrowing owl	• Great Basin spadefoot toad • western rattlesnake

(see Appendix 4—*Resources Section* for where to get complete provincial and national lists)

Caribou

Roles

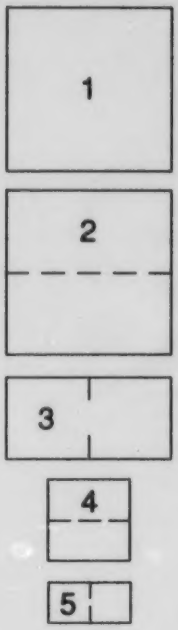
1. "Nature's Counters" are responsible for counting the number of "offspring" which land in each of the habitat islands. Students can take turns in this role, 2-3 at a time.
2. "Parents" are challenged to populate "habitat islands" with as many "offspring" as possible. The remainder of the class take this role as parents of the animal or plant of their choice.
3. "Natural Occurrences" determines when dispersal will start and when it will end, as well as the size and distribution of the habitat islands. The teacher takes this role.

Preparations

1. Introduce students to the idea of habitat islands and the concept of species dispersal. Use a map of your region, showing the "green islands" of parkland. Locate a possible "source habitat" (park or other large natural area) and several "habitat islands" (natural habitat surrounded by human development).

2. Use the chart paper to create several "habitat islands" of different sizes as illustrated opposite.
3. Supply "parents" with several sheets of paper. Ask students to take a few minutes to produce lots of offspring by wadding small pieces of paper to represent their plant or animal. An option is to represent different species with different colours of paper (and then to compare the success of different dispersal strategies). Another option is to use tiddly-winks, bean bags, pennies, beans or lentils for "offspring"—be aware of the "bounce" factor, however!
4. Demarcate a "source habitat" with a line of masking tape. Students must remain behind that line as they aim their "offspring." Leave enough room to arrange the "habitat islands" far enough from the "source habitat" to make the activity challenging but not impossible. For each challenge, the "habitat islands" will be positioned differently.
5. At this point, you may wish to ask "parents" why it is important to their species that their "offspring" reach and be able to survive on the other habitat islands. Perhaps there is a lack of available space in the source habitat, or perhaps there is a lack of genetic diversity and they want to increase chances of mixing with other members of the same species, etc. (Note: As far as we know, animals don't think this out, they just disperse!)
6. You might also discuss dispersal strategies: just as there are many ways to toss paper or pennies, there are many ways that plants and animals disperse. For example, dandelion seeds fly on the wind, and frogs hop between ponds and forests. What are the implications of the different strategies? "Different species" of "parents" (as represented by different colours of paper) might use different strategies.
7. Use blocks of other building materials to simulate mountains on some islands, comparing the number of offspring trapped on those islands to the "flat" islands with no mountains. Islands with mountains usually have more species than those without!

a) Challenge I



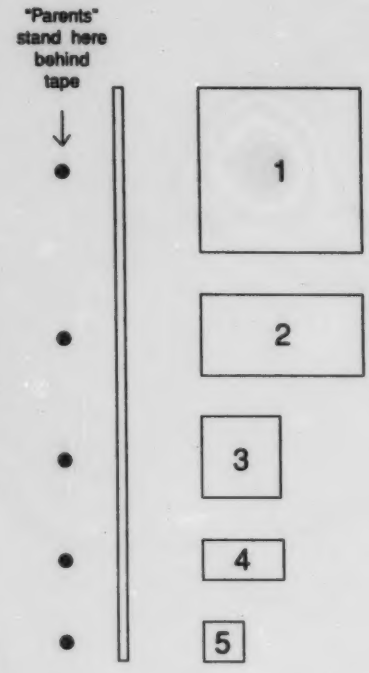
b) Challenge II

Challenge I

"Parents" aim their "offspring" to a series of paper habitat islands that vary only in size. In this way, the class investigates how the size of an island influences the number of individuals that "arrive safely."

1. Arrange paper habitat islands in a single line in the middle of your play area (see illustration opposite). Name or number each island and measure and record the area of each. Secure the islands to the floor with tape.

2. "Parents" form one long line parallel to and facing the habitat islands, more than one metre away.
3. Ask students to predict what might happen when the "parents" begin to disperse their "offspring." Record their predictions.
4. Begin dispersal by letting "parents" know it is springtime.
5. After a few minutes (or when most of the "offspring" have dispersed), stop dispersal by asking "parents" to go into hibernation (or to migrate).
6. Counters tally the total number of "offspring" on each habitat island and record these totals. The total number of "offspring" that land outside the habitat islands could also be counted and recorded. Compare these results with the students' predictions.
7. Now, in the area between the "source habitat" and the "habitat islands," place paper to represent a storage warehouse for automotive parts, a new golf course, a large field of potatoes, a housing complex, and numerous highways and roads that weave among the habitat islands (students may have other ideas). Neither "parents" nor "offspring" can survive there, only the "islands" and "source" contain suitable habitat. The parent generation can, however, move about inside the "source habitat" to optimize the chances of their offspring reaching one of the other "habitat islands."
8. Repeat steps 3 through 6. How does human development such as roads, houses, or agriculture impact on "parents" and "offspring" of a population?

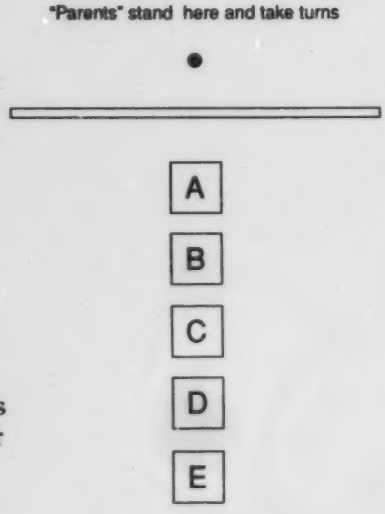


Challenge II

"Parents" aim their "offspring" to a series of habitat islands that vary only in distance from the source habitat. The variable is now distance.

1. Make a new set of "same-size" habitat islands from the chart paper, and arrange them so that each is a different distance from the source habitat. You may want to label these islands differently from those in Challenge I. See illustration opposite.

2. Repeat steps 3 through 6 as outlined for the first Challenge, except parents take turns dispersing their offspring from one location (2 - 3 at a time). Make sure to record distance as well as area.

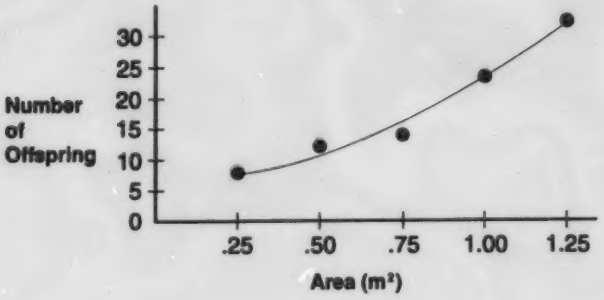


To Conclude

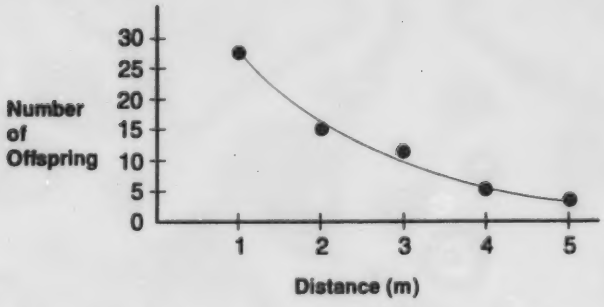
1. Using the student worksheet, ask students to create line graphs to illustrate the results of Challenges I and II (see diagrams) for an analysis of the relation between size or distance, and number of offspring. With younger students, one class set can be created.

2. In small groups, have students interpret the graphs and discuss how area (Challenge I) can affect the number of individuals found on habitat islands. How does distance or isolation (Challenge II) affect the number of individuals? Did most offspring find a good place to live/grow?

CHALLENGE I



CHALLENGE II



3. Discuss these questions:
   - Plants can disperse with the wind, and some animals can move about by flying or swimming, but many travel about on foot. How can we help these animals migrate to neighbouring habitat islands?
   - If we are unable to protect a single large area, what can we do to provide habitat for animals which require large expanses?

Journalling

Choose a few species of plants and animals that live in British Columbia. Find out how they disperse and what their habitat requirements are. Then describe what we need to do to ensure they will not be threatened by extinction within 200 years.

Imagine that you, your classmates and your families lived on a habitat island 10 km in diameter. Write a story or draw a picture to illustrate how your life would change. Consider two scenarios:

1) Your habitat island is surrounded by industrial waste.
2) Your habitat island is surrounded by pristine wilderness.

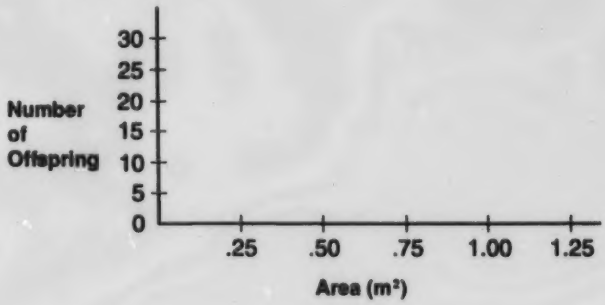
Student Worksheet

Name: _____

Date: _____

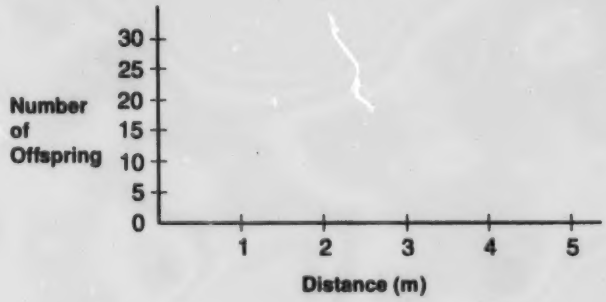
1. Using the graph at right, graph the number of offspring that survived with the area of the habitat island *(Challenge I)*
   - How does the size (area) of the habitat island affect the number of offspring that survive?
   - What is the relationship between the location of protected habitat islands and surviving offspring?

CHALLENGE I



2. Using the graph at right, graph the number of offspring that survived with the distance traveled to the same size habitat islands *(Challenge II)*
   - How does the distance that the offspring have to travel to habitat islands affect their survival? Did most offspring find a good place to live or grow?
   - Why would you think a road or a housing development might affect the survival of a species that is traveling from one habitat island to another? List at least four reasons.

CHALLENGE II



- If you were a wildlife manager, based on what you have learned about the size of habitat islands, their distance to one another and the survival of offspring, what choices would you make about the size and location of habitat islands? Explain your reasons.

3-2. Plants and Animals of Protected Areas

Activity Summary

Students research British Columbia animals and plants that live in protected areas, identify the biogeoclimatic zones in which their organism can be found, and apply their new knowledge through a creative presentation technique.

Learning Outcomes

It is expected that students will:

- compare and contrast the major biogeoclimatic zones in British Columbia;
- determine the influence of a variety of factors on plant and animal life from different biogeoclimatic zones;
- use information they have collected to organize and present knowledge about a plants or animals from biogeoclimatic zones using variety of written, oral, or graphic forms;
- describe why the presence of a species might be important in making decisions about protection of natural areas.

Key Concepts

- Many protected areas are islands of wildlife habitat surrounded by human development. To sustain them, we need to make management decisions based on knowledge of the local environment.

Key Terms

Biogeoclimatic Zone • Species

Materials

- list of animal and plant species chosen from British Columbia's 14 Biogeoclimatic Zones (Appendix 1) and Ecoprovinces (Appendix 2)
- Biogeoclimatic Zone map (go to *www.for.gov.bc.ca/research/becweb/becinfo/bec-view.htm*)
  (see Appendix 4—*Resources Section* to order large biogeoclimatic map of B.C.)
- List of National and Provincial Parks by Biogeoclimatic Zone (Appendix 3–4)
- 14 small pieces of paper
- a hat, pencils, resource books on B.C. animals
  (see Appendix 4—*Resources Section*)
- materials for making postcards
- reference list for student research projects
  (see Appendices 4 & 9)

Time

Preparation: 30 minutes to gather and copy material (NOTE: need to make a transparency for overhead projector)

Activity: 2-3 periods plus research time

Background

British Columbia has it all! There are more species of living things here than in any other province. Three of the four main climate types in North America are found here, along with some of the most breathtaking and varied scenery on the continent. From our wet coastal rain forests to our dry interior grasslands to some of the world's highest mountains, British Columbia has a great diversity of habitats where plants and animals find the food, water and shelter they need.

To help ensure that we protect these habitats and the species that live there, scientists identify and classify areas according to their natural features and ecological processes. Two classification schemes are used in British Columbia. The **Biogeoclimatic Zone System**, developed by the late Dr. Vladimar Krajina at the University of British Columbia, is one such system.

There are 14 biogeoclimatic zones in British Columbia. Each has a characteristic climate, plant life and soil type. Together, these elements influence the hundreds and thousands of species that live in each zone. This scheme does not include classifications of any aquatic environments.

Another widely used system is the **Ecoregion Classification System**, developed by Dennis Demarchi and others within the British Columbia Ministry of Water, Land and Air Protection. By using these systems, we have a language for talking about landscapes and ecosystems. This classification scheme is more concerned with descriptions of areas with similar climate, physiography, oceanography, hydrology, vegetation, and wildlife. There are 10 ecoprovinces in British Columbia. The educational guide ***Backyard Biodiversity and Beyond*** has information and activities about British Columbia's ecoprovinces: refer to it for more information, or to the reference list in Appendix 4—*Resources Section*.

Connections

Project WILD

- Graph an animal, p. 125
- What Bear Goes Where?, p. 122
- Designing a Habitat, p. 70
- Habitat Rummy, p. 38

Backyard Biodiversity and Beyond

- Biodiversity in British Columbia (3-1)
- Ecoprovinces of British Columbia (3-4)
- Biome Biography (5-4)

Let's Begin!

The plants and animals you will learn about in this activity have been selected to both represent British Columbia and to provide a varied, interesting mix.

1. Project the map of British Columbia's **biogeoclimatic zones** on an overhead, and discuss it as a class. Explain that all areas of the province have been divided into 14 zones. Each zone has a characteristic climate, plant life, and soil type.
2. Choose 14 British Columbia animals and plants (Appendix 1 lists the biogeoclimatic zones and relevant plants and animals) and write their names on small pieces of paper. Fold these papers and toss them into the hat.
3. Divide the class into 6 groups. Have a member from each group select a folded paper from the hat and share it with the group. Stress that each group must keep their animal a secret—they will be making class presentations about their mystery animals!*
4. Using the student worksheet as a guide, ask each group to find out as many details about their animal and its habitat as they can.
5. After the group is finished researching, ask each group to create a "story", song, illustration, or poem, which tells about the amazing world of their plant or animal. These stories must not reveal what the plant or animal is, but should provide "clues" about the plant or animal and its habitat. Each group should also design a simple symbol to represent their species.
6. As groups present their stories, students try to guess what species it is, and where it lives. Note the biogeoclimatic zone where each group's plant or animal species is from as groups present their findings. Allow some time for discussion of the mystery species and their habitats.

   NOTE: If time is a factor, have students work independently on an animal and present their "mystery animal" in small groups.

Red Crossbill

Biogeoclimatic Zone/Ecoprovince Postcards

7. Have each group adopt a different biogeoclimatic zone or ecoprovince and design a postcard. Students should include at least three identifying features of their region: such as its location with respect to other regions, temperature, rainfall, vegetation, animal life (including their "mystery animal"), and

*"Mystery Animal" adapted from J. Cornell, (1989). *Sharing The Joy of Nature*, Nevada City, California: Dawn Publications.

topography. Encourage students to explore relationships between these features. For example, vegetation in a region can tell us something about average rainfall, soil type and latitude. They can use visuals or words.

8. Display and discuss the postcards. Has enough information been included in them to distinguish and identify the biogeoclimatic zone or ecoprovince? What could be included/ taken out?

Student Worksheet:

Name: _____

Date: _____

Name of your plant or animal:

- What biogeoclimatic zone(s) does your plant or animal live in?
- How big is the animal or plant?
- How does it get its food?
- What does it look like?
- What does it eat?
- What eats it?
- Where does it live?
- Who are some of its neighbours?
- Where does it find shelter?
- If it is an animal, how does it get around? How big is its home range or territory?
- How does it find a mate?
- What does it do in the winter?
- What are some interesting or unique things about it?
- Is your plant or animal found in all of the biogeoclimatic zones? Why or why not?
- List any national or provincial parks that are in your plant or animal's biogeoclimatic zone.
- Why might finding a unique plant or animal in a biogeoclimatic zone be important in decision-making about protection of natural areas? Explain your reasons.

Extension

1. **Find** the name and address of a school in or near each biogeoclimatic zone.
2. **Write** to the same grade class to tell about your project and to find out more about their region.
3. **Ask** them to send you a postcard. You can do this on-line as well.
4. **See** Appendix 4—*Resources Section* for how to contact interested schools.

Journalling

Draw your plant or animal in the biogeoclimatic zone where it is found.

If your mystery species is an animal, does your animal live in the same zone in both summer and winter?

If your mystery species is a plant, what is its life cycle? Does it live all year 'round or, does it die back in the winter?

3-3. Schoolyard Surveys: Save That Space for Us!

Activity Summary

Students choose, map, and negotiate special use areas in the schoolyard to experience some conflicts and compromises associated with "special use." In this activity, students establish areas to set aside for their special interests, then come together and use a simple decision making process to try to resolve any conflicts that may have arisen among the different interest groups.

Red-backed Salamander

Learning Outcomes

It is expected that students will:

- measure the perimeter of their "special use area";
- work to scale with the map provided;
- predict or suggest possible problems associated with particular situations or courses of action;
- practice cooperative decision-making; and
- display responsible decision-making in small group work.

Key Concepts

- We protect things that are valuable to us. Our heritage and culture influence our values.
- Protection is an ongoing and complicated process that has both costs and benefits.

Key Terms

Cost/ Benefit Analysis • Decision-making

Materials

- journals
- clipboards
- graph paper
- coloured chalk
- measuring tapes (one per group)
- surveyor's tape (optional)

Time

Preparation: 15 minutes to organize equipment

Activity: 2 periods

Background

Setting aside any area for a special purpose almost always generates discussion and controversy. Building a skating arena delights the hockey player, but it may destroy valuable agricultural land and/or mean that a grove of trees must be cut down.

Connections

Project WILD

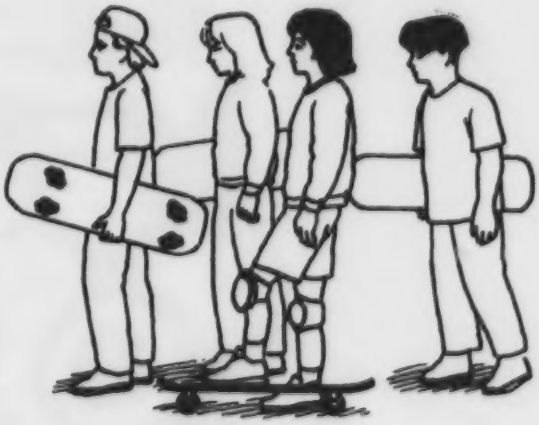
- To Compromise or not to Compromise, p. 295
- Planning for People and Wildlife, p. 306

Compromise is a complicated and challenging goal. In this cooperative decision-making process, students seek areas of common interest and points of agreement. They may be able to create a win-win situation, where a solution that everyone can live with is found. At the very least, using this process will help ensure that every individual's viewpoint is valued in the decision-making process, and no opinion goes unheard.

Guidelines for Using Cooperative Decision-making with Your Students

- Each choice should be discussed until every group member has had a chance to speak.
- Persuasion and convincing is part of decision making, however, peer pressure is not permitted.
- A simple cooperative decision making process is:
  1. Define problem
  2. List alternative solutions
  3. Assess costs and benefits of each solution
  4. As a group, make a decision.

A Cost – Benefit analysis is a technique used to assess the balance of known costs versus the benefits of a solution or proposal over a specific period of time. Usually, both the costs and benefits should be measurable or at least identifiable. Costs are usually associated with goods, services, and resources needed to get the project or solution to the problem underway; while benefits can be seen as the goods, services or other positive aspects of the project or proposed solution when it is completed.



Let's Begin!

1. Brainstorm with class a list of user groups of your playground. Some special interest groups might include:
   - Street hockey
   - Basketball
   - Green space
   - Playscape
   - Soccer
   - Skateboarding
   - Other
2. Divide the class into groups of four or five. Post a notice to the effect: "The schoolyard is up for grabs! All groups with a special interest in the area are invited to attend a meeting where decisions will be made about how certain areas of the schoolyard can be used."
3. Each group will be given the task of deciding on their special interest in the schoolyard (to skateboard, play soccer, etc.). They must then determine:
   - which area they want to set aside;
   - a justification for wanting that area;
   - the criteria or special characteristics of the area that meet their needs; and
   - actual boundaries and rules for their area.

   An example might be: a special area set aside for basketball. Justification might include the "interest groups" (various basketball teams) and "the greater good" (increased health and fitness) aided by this sport.

   Criteria would be the type and size of area needed. Boundaries and rules would include its actual size, upkeep guidelines, who could use the area, activities that could go on in the area in addition to basketball, as well as necessary "buffer zones" (neutral areas around the special area).
4. Encourage students to prepare themselves for future negotiations by developing strong arguments for their special interest group and the need for their area. They will also benefit by predicting potential conflicts, other competing interests and what they might have to protect their areas from.

   Check in with students to ensure they have chosen areas and uses that are potentially conflicting so that there is reason to negotiate!

In the schoolyard

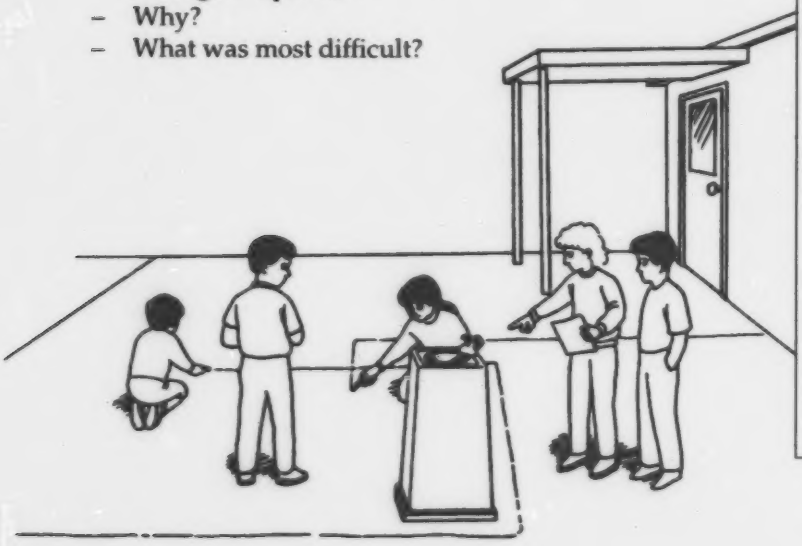
5. Measure the perimeter of the schoolyard. Using graph paper, have each group map the schoolyard to scale and fill in answers to questions on the student worksheet.

6. Groups should then to mark the boundaries of their special areas with chalk or surveyor's tape.
7. Finally, students should measure and map out their special areas on their schoolyard maps.

   NOTE: There are likely going to be conflicts when students realize other groups plan to use "their" area. Tell them not to consider the other groups at this point.

Back inside

7. Create a single classroom map with the different use areas indicated by different colours.
   - Are there any overlaps?
   - What problems arise when all the areas have been added?
   - Which area has the most conflicting use?
   - Which one has the least?
8. Ask students to meet with one or two groups whose special area overlaps their own.
   - Review the decision-making guidelines with the students (above).
   - Ask the groups to come to some agreement so that their special areas can co-exist: whether the boundaries, rules, or uses have to be altered.
   - Once they have reached an agreement (it's best to set a time limit!) ask each group to present their solutions to the class.
   - Discuss the similarities and differences as to how the groups came to an agreement or compromise.
     - Who gave up what?
     - Why?
     - What was most difficult?



Journalling

1. Were your opinions heard by the group?
2. Did you have to change your opinion or give up something you valued in order for the group to make a decision? Was time a limiting factor?
3. What were some of the things you liked or didn't like about this decision-making process?
4. What problems came up for the group? How did the group solve these problems?
5. Did some groups not come up with a solution? Why not?
6. How might you use this decision making process in your daily life?

Extension

1. **Set** a time limit for negotiation.
2. As a class, **use** consensus to try to find a way to meet the needs of all the groups. **Redefine** boundaries, rules and uses as necessary, etc.
3. **Check out** the Evergreen Foundation's schoolyard naturalization program (see Appendix 4—*Resources Section*). They'll provide money to buy native plants for greening your schoolyard.

Student Worksheet

Name: _____

Date: _____

Group Name: _____

1. Using the back of this sheet, make a map of your school yard.
2. What area would you like to dedicate to your group? Outline it on the map.
3. What is the perimeter of your area?_____
4. Why should this area be set aside for your group? List at least four reasons.

5. Identify the special characteristics of the area your group has chosen that meets your group's needs.

6. If this area was set aside for your group's use, what rules would you make to protect your area and its users?

Back in the classroom

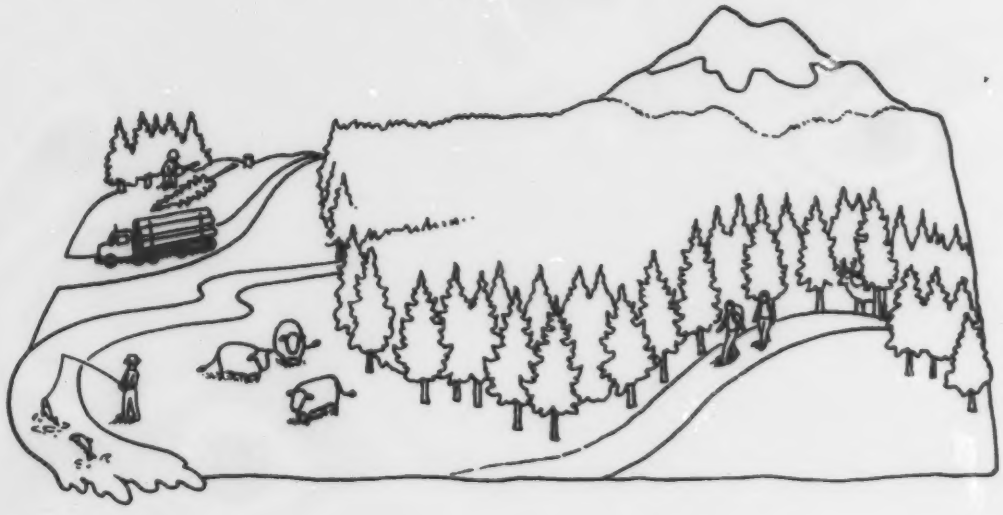
You are challenged to come up with a solution to a problem at your school yard between two special interest groups who both want to use the same space. Use cooperative decision-making to come up with a solution.

1. Describe the problem as you understand it:
2. What are some alternative solutions to this problem:
3. Assess costs and benefits of each solution

Costs	Benefits

4. As a group, what is your decision?

4.
Caring for Protected Areas



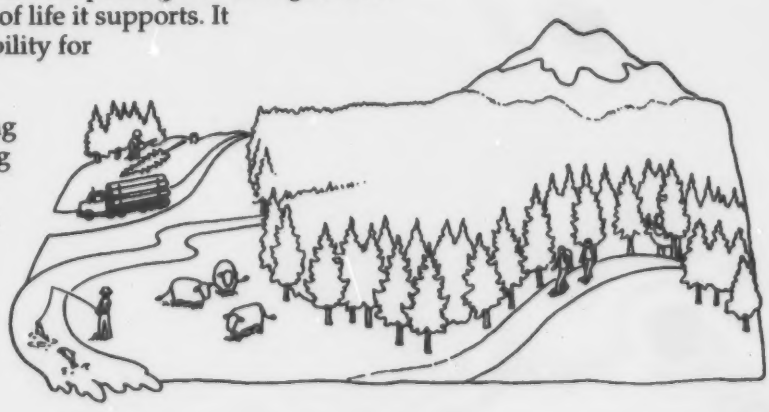
Caring for Protected Areas

We have explored the *what*, *why*, and *how* of protected areas: examining the definition of protected areas throughout our province, why we protect, and how protected areas are protected. However, once an area is "protected" in one form or another, the protection process is not over. We must care for our protected areas if they are to remain viable into the future. The term that is often used to mean caring for land or resources, is "environmental stewardship." Stewardship is about recognizing and developing a sense of custodianship towards the environment by local citizens and communities. Stewardship can offer new ways of meeting protection objectives within and outside of park boundaries. It integrates and complements the whole array of tools we use to protect our environment. Stewardship is a commitment to sustain protected areas for the future. The time we spend today in stewardship will influence the fate of a protected area for our children and our children's children. As the number of parks and protected areas in the province increases, stewardship involvement becomes vital to sustaining these.

The objectives of the following activities are to explore the process of caring for and managing our protected areas. *Stewardship BINGO* introduces students to the concept of stewardship, ways they can become stewards, and the tools involved. *Caring for Compost* brings the concept of stewardship to a very practical level involving everyday actions that students can take to protect our environment. *Protection Partnerships* sends students out into their community to research and propose some simple ways to care for a specific animal and its habitat. The *Stewardship Mural* is an activity that enables students to share what they have learned about protected areas and their stewardship. Finally, students (and all of us) need to take action if we are to care for protected areas. This section poses a series of challenges for students to get active!

"To most of us, stewardship means respecting and caring for the environment and all the forms of life it supports. It also means assuming responsibility for our actions."[1]

"Stewardship is the act of taking responsibility for the well-being of the environment and doing something to restore or protect that well being."[2]



[1] *Lost Streams of the Lower Mainland*
[2] *Community Stewardship: A guide to your own group*

4-1. Stewardship BINGO

Activity Summary

A game of "BINGO" introduces students to examples of stewardship activities. Students then sort these activities into categories (home, school, community; park) where they can participate in stewardship.

Learning Outcomes

It is expected that students will:

- identify stewardship activities that help care for a protected area; and
- demonstrate an understanding of the concepts of sustainability, stewardship, and renewable versus non-renewable resources.

Key Concepts

- Stewardship refers to caring for what we don't or can't own. By caring for protected areas we can become stewards of the land.
- Protected areas are affected by our actions within and beyond their boundaries. Successful protection depends on the commitment of everyone involved.

Key Terms

Stewardship activities • Protected Areas • Responsibility • • Steward

Materials

BINGO template

BINGO stewardship activities

Extra paper

Scissors

Glue sticks

Moose

Time

Preparation: 15 minutes to photocopy stewardship cards and bingo templates

Activity: 1 period

Background

Stewardship involves participating in a variety of activities that can take place either in a backyard or in a protected area such as a park. For example, stewardship of our backyard habitat may involve composting our garden waste, while stewardship of a park by students may involve respecting wildlife by using binoculars to not disturb nesting Great Blue Heron. Protected areas managers

use a variety of tools such as land-use management plans and outreach to encourage stewardship in the areas they manage. This activity focuses on ways students can participate in stewardship of some protected areas near their home, school, or community.

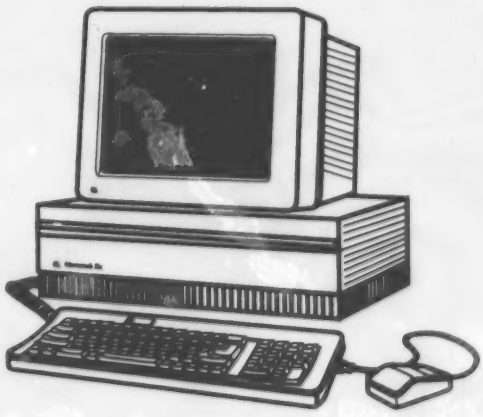
Let's Begin!

1. Photocopy Student Worksheet

(student worksheet to have at least 20 different examples of stewardship activities – an icon plus simple text)

Sample activities on small cards:

Pick up litter
Report fires
Respect wildlife
Compost
Recycle
Re-Use
Reduce
Don't release pets into the wild
Keep dogs on leashes in protected areas
Monitor habitat
Respect the rules
Volunteer in stewardship projects
Know your heritage traditions
Make a butterfly garden
View wildlife
Preserve local trees
Green-up your school yard
Leave plants and animals where you find them
Respect sensitive habitat
Participate in a stream clean-up
Make a wildlife brochure or pamphlet
Label storm drains that lead to fish bearing streams
Participate in a bird count
Build nesting boxes
Make a map of local "special places"



2. Students should colour, cut, and paste stewardship cards onto bingo template prior to playing the game. Teachers should instruct students to "mix-up" their cards so that all students have different bingo cards. Students also need to cut up blank cards for playing the game.
3. Teachers call out "Bingo style" the letters of STEWARD with an activity. This may be done by drawing the letters and

stewardship cards from a hat or other container. For example, call out "S" and "Green-up your school yard". Students who have a card "Green up your school yard" under the "S" column can then place a blank card over that space.

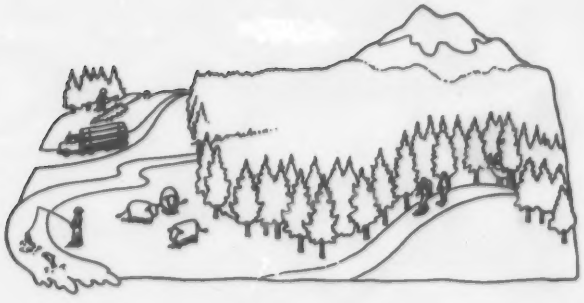
4. The aim is to complete a row, either vertically, horizontally, or diagonally, to win.
5. Continue calling out letters and activities until someone calls out "Steward!" when they have completed a row.
6. When most (or all) students are "stewards" ask students where they think these activities should take place. Is it appropriate to make a butterfly garden in a park or is this better to do at home or in the schoolyard? Draw the same game template on the board and then discuss with students where it is best to place each stewardship activity: home, school, community, or park. Discuss the pros and cons of each. Some activities might fit into all places – others may only be appropriate for one type of area.

Extension

Play different types of Bingo. Some variations include:

- Four corners: cover all four corners plus the middle
- One corner patch: cover one corner with four cards
- Opposite corner patch: cover two corners with four cards each.

Winners of the bingo game can then become the Captain of the STEWARD-SHIP



4-2. Protection Partnerships

Activity Summary

Students choose an animal (bats or amphibians) that lives in their community, to research. Using the background material provided (to be developed), they then design and draw a poster describing their species and how people can work together to be stewards of its habitat.

Learning Outcomes

It is expected that students will:

- identify the unique characteristics and issues about their species;
- design, implement, and assess strategies to solve a community project or problem related to bats or amphibians;
- research and present information using graphic illustration and written communication on stewardship of their species' habitat; and
- identify role models in their community, who are active in stewardship of bats or amphibians.

Key Concepts

- Protected areas are affected by our actions within and beyond their boundaries. Successful protection depends on the commitment of everyone involved.
- Stewardship refers to caring for what we don't or can't own. By caring for protected areas we can become stewards of the land.

Key Terms

Partnerships • Stewardship groups • Stakeholders • Bats • Amphibians • Management • Buffer zones

Materials

Background information on Bats and Amphibians

Poster board

Pens, markers, pencils

Time

Preparation: 15 minutes to gather information; 30 minutes to contact local groups (optional)

Activity: 2-3 periods

Background

Bats and amphibians (frogs, toads, and salamanders) are animal species that are little understood by the general public. This lack of understanding can lead to loss of habitat and, ultimately, declining population numbers. The loss and fragmentation of amphibian habitats in British Columbia, as well as their declining population numbers worldwide, make it critical that we take responsibility for these creatures and their habitat in order to ensure their survival. Bats are less threatened by habitat loss than amphibians; however, misinformation about their life cycle, habitat, and ecological value often provokes misunderstanding and superstition. Bats and amphibians make ideal subjects for student research to improve understanding, and for stewardship projects that students can undertake at home or in their community. For example, students in West Vancouver, B.C. started a program that examined the population of tailed frogs near their school. When they found out that tailed frog habitat was threatened by human activities, they brought this issue before the public and, ultimately, the habitat was protected. Other students have participated in community programs for creation of bat boxes to create suitable nesting sites for bats, thus protecting local bat species.

Let's Go!

1. Choose either bats or amphibians as the class focus. Split the class into small groups for poster work; alternatively, this may be done as an individual project.
2. Students should use the background material provided (to be developed) on Bats in BC or Amphibians in BC to research the following:
   - Bats:
     - identify native species likely to be found nearby the school-yard and at home;
     - research the appropriate species: find out about its life cycle, where it lives (habitat), and what it eats;
     - identify community groups or others interested in protection of bats and what they are doing to protect bats; and
     - brainstorm ways to be stewards of bat habitat

Ponderosa Pine

- Amphibians – Frog Watch (*wlapwww.gov.bc.ca/wld/frogwatch*)
  - identify native species likely to be found near the schoolyard and at home;
  - research the appropriate species: find out about its life cycle, where it lives (habitat) and what it eats;
  - identify community groups or others interested in protection of amphibians and what they are doing to protect amphibians; and
  - brainstorm ways to be stewards of amphibian habitat

3. After students have collected this information, invite a guest into the classroom who is interested in protection of bat or amphibian habitat and find out about projects he or she might be involved in. Alternately, in class discuss ways that students might plan a project to protect bat or amphibian habitat (write letters, have a "Bat Celebration" or a local "Frog Watch" amphibian count, etc.).
4. Using the information they have collected, students then make a poster on stewardship of bat or amphibian habitat. The poster should include information on their species' life cycle, habitat requirements, and ways that humans can be stewards of local bat or amphibian habitat.

Extension

Students can plan and implement a stewardship partnership project on protection of amphibian or bat habitat. This activity gives students an opportunity to participate in the protection of habitat and to learn of possible careers in that field.

4-3. Paint a Stewardship Mural

Activity Summary

This activity may be used as a culminating event for your protected areas program. Students use water-colour or tempera paints to create a mural that represents the relationship between people and a local protected area.

Learning Outcomes

It is expected that students will:

- communicate to their school or community their understanding of stewardship, using visual images;
- demonstrate their understanding of the definition of protected areas;
- create images that show an understanding of how humans use B.C.'s living resources, within and outside of protected areas; and
- demonstrate an understanding of the concepts of sustainability, stewardship, and renewable versus non-renewable resources.

Key Concepts

- Many protected areas are islands of wildlife habitat surrounded by human development. To sustain them, we need to make management decisions based on knowledge of the local environment.
- Protected areas are affected by our actions within and beyond their boundaries. Successful protection depends on the commitment of everyone involved.
- Stewardship refers to caring for what we don't or can't own. By caring for protected areas we can become stewards of the land.

Key Terms

Protected areas • Stewardship • Living Resources

Materials

Water colour or tempera paints

Dishes(paper plates, jars) to hold paints

Brushes, water jars & water

Large paper or banner (long),

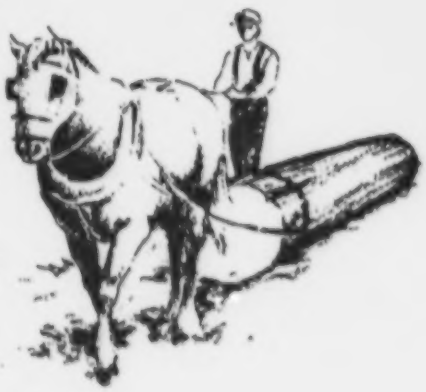
Paper towel/cloths and newspaper/garbage bags

Time

Preparation: 15 – 30 minutes to organize materials and set-up painting area. You may want to tape garbage bags or newspaper under and surrounding painting area to minimize spills and paint on floor. Have paper towels or cloths on hand just in case some dripping occurs!

Activity: 2-3 periods

Let's Begin!



1. Split students into groups, trying to have approximately 6 groups in total. Each group will be responsible for creating a mural depicting what is happening both within and outside the boundaries of a protected area. Encourage students to think about what kind of people use these areas, and what their role might be. For example, within the protected area, you might find a naturalist walking along a trail, or some wildlife resting near a stream. Outside of the protected area, there might be someone building a house, or someone driving on their way to work. Further encourage the students to think of what activities are happening outside the protected area that might affect the inside, and vice-versa. Do many human actions have an impact on protected areas?
2. Groups should make a web diagram to get ideas of connections and help inspire them as to what they want to include in their mural.
3. Get each group set-up at a painting area. Give students most of the period to paint their murals, but save some time at the end to compare and discuss the different groups' paintings.
4. Have the murals hung throughout the school for other students to see, or mount them around the walls of the classroom to encourage further discussion on protected areas at a later date.

5.
Protection In Action!

Protection In Action!

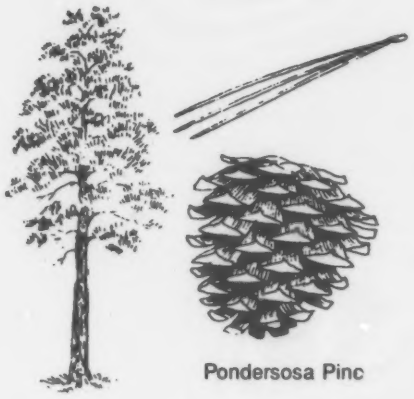
Apply your students' enthusiasm and interest in protection through action projects: things they can do with other students, their families and the community. This section provides action guidelines, plus lots of suggestions and contacts: look through them all to find ideas that are applicable to your teaching situation.

The Goals of Active Learning:

- To develop students' capacities and skills to effectively anticipate the consequences of their actions in advance of taking action;
- To enhance students' self concepts by empowering them to be independent thinkers and instilling the confidence for leadership that comes from acquired knowledge, understanding, skills and experience built upon previous successes; and
- To develop in all students the spirit and requisite skills that inspire, motivate, and prepare them to be full participants who can, with confidence, work within the frameworks of the democratic system to implement positive change.

(from McClaren *et al*, 1995)

1. Guidelines for an Action Program



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The students (not the teacher) should decide upon and select the problem or question they feel is important to work on.

Give students many opportunities to practise important action skills, such as:

- observation, investigation, and inferencing skills
- group organization skills
- communication (letter writing, phone calling, public speaking) and lobbying skills
- presentation skills (verbal and graphic)
- conflict resolution skills

Take Only Positive Positions

Be for something rather than against something! If you're against something, you must be for something else . . . what is it? What is your wish? Be positive!

Do Your Homework . . . Become an Expert

Be prepared. Complete your research, read widely on the subject, interview experts. Know that what you are saying is based on evidence and facts.

Probe the Force Field

Become aware of who and what else is involved in your chosen issue or problem. Know who's for, neutral, or against your position. Know their positions and what strategies you might use to accommodate their interests. When you encounter a "block," back off, reconsider your options, design a plan, and move on towards your goal.

Keep a Balanced View, Empathize with All People's Views

Attempt to see all sides of the issue. Walk in the other person's shoes. Attempt to know what values and principles your position is based upon. Personally contact and meet with others with different views from yours to get to know them and why they see it differently.

Individualize . . . Eliminate Stereotyping

Treat everyone as a person of high moral worth. Recognize that each person holds his or her own identity within a group. Stereotyping is more often than not limiting and misleading, often blocking solutions rather than building bridges among people or groups.

Remain Flexible . . . Keep Your Options Open

Be willing to adjust or change your position in the light of new information. Remain flexible, yet decisive, based on your carefully conceived value positions. Never forget the values and principles that are the basis for your position on the issue, but keep an open mind.

Accept Responsibility . . . Eliminate Scapegoating

Never blame anyone or anything else for your lack of success. Rather than making excuses or blaming others when things don't go as planned, accept that your team did not do everything it needed to do as effectively as it needed to do it. Most importantly, design an action plan based on your analysis to move toward attaining your goal. Then begin again!

Be Persistent . . . Recycle

Try, try again until you are successful. When you don't succeed the first time you never start the second try at the same point, as you have learned a great deal in your first attempt. So, recycle through the process again! Attain success!

Celebrate!

Hold a celebration when the entire project or a significant part is completed, to highlight students' achievements.

It is important for teachers to help students break their "end goal vision" into key steps and milestones. In this way, if there are delays to reaching the ultimate goal, students will still have a positive sense of accomplishment and of partial closure.

(from Hammond, in *McClaren*, 1995)

2. Ideas For Protection in Action Projects!

Get out and do it! Get involved in protection projects at home, in your community and in your region. This section includes ideas and suggestions for what individuals and groups can do to become actively involved in protection, conservation and enhancement at home, in your community, and in natural areas.

At Home

a) Record your family history

- Interview your parents and grandparents and record their stories.
- Keep these stories in a folder marked "Family Archive" and add to this folder as more stories and details are recalled.
- In your archive, include pictures of your house (both the inside and the outside), your family, your daily activities and interests.

One day, your archive may provide invaluable information on your community or family history!

b) Shop locally

Try this challenge: For one day or one week, get your family to try and buy only food that comes from British Columbia.

- Was it difficult?
- What did you have to give up?
- What does this tell you about our use of resources?
- Do other species of animals eat so far away from "home?"

c) Find out about the Environmental Choice Program (which certifies environmentally friendly products)

- What criteria must products and services meet in order to receive the "Ecologo" stamp?
- Share your findings with family and friends.
- Contact: Environmental Choice Program, Environment Canada.

d) Create your own code for environmental citizenship

- Ask a family member, a friend or your classmates to take part in developing and living by this code.
- Contact Environmental Citizenship, Environment Canada for more information.

In Your Community

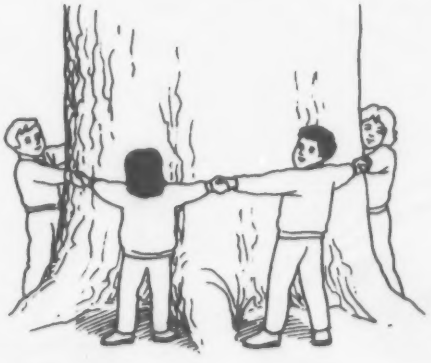
a) Visit your local museum

Find out how you can preserve photographs or anything else you value.

b) Collective Action

- Brainstorm ways to be involved in protecting natural and cultural heritage.
- Join a local society, attend a community meeting, become a member of the local museum, volunteer at the library, or assist in a greenhouse.
- Find a local association concerned with community green spaces and get involved.
- Some students might be interested in designing and initiating their own projects such as a community garden, a community composter, a community clean up, creating a new recreation area or something else adults have trouble imagining.

The possibilities are endless! By getting involved, you are making a unique contribution to your community's living history and helping shape the community for future generations. See Appendix 5—*Resources Section* for contacts.



c) Preserve local trees

Small trees or shrubs don't have to be destroyed for buildings or renovations. They can be transplanted to another location.

- Take an active part in saving trees in your community.
- Find out which tree species are native to your area, then plant one of these species in your backyard.

In some communities, a local arborist is hired by the city to survey local trees. Contact your municipal government.

d) Backyard Homes for Wildlife!

- Create habitat for local native species in your own backyard or in the school yard.
- Get permission to develop a Wildlife Garden and/or a Butterfly Garden at your school. This has been done successfully at several schools throughout the Lower Mainland of British Columbia.
- Contact Naturescape British Columbia, a program to help you increase local biodiversity through modifications to your backyard, and the Evergreen Foundation, who provides money for greening schoolyards.
- See Appendix 4—*Resources Section* for further contacts and books.

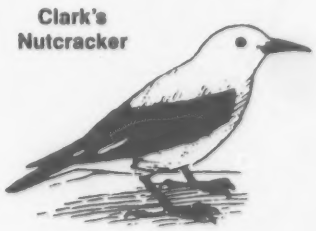
e) Attract backyard wildlife

- Build a bird feeder in your backyard.
  - Your feeder can be designed like a mini-table with a flat piece of wood for the table top and a sturdy pole or post for the base.
  - Nail some wire mesh around the edge of your bird table to prevent cats from climbing on it.
  - Secure the table near a tree so birds can check it out.

  Some feel that when you provide birds with food in the winter you must continue throughout the season as birds will depend on it.
- Contact the museum or the natural history society and find out what types of food are best for feeding wild birds.
- Use your logbook to record what you notice about the birds that visit your backyard.
  - Do they come alone or in groups?
  - What do they feed on?
  - What time of day do you see them?

Water is essential for wildlife **all** year round.

- Set up a water bath for birds in your backyard.
- Insects and amphibians need water too. You may want to put small sources of water out for these creatures as well.


Clark's Nutcracker

Natural Areas

a) Start a nature logbook

- Carry your logbook with you everywhere and record the things you see.
- Start each day on a new page.
- Record what the weather is like that day, what you find and where you find it.
- Record what you observe and what you hear.
- When you discover something that you didn't know existed, make a note of it!
- Use your logbook to draw in as often as you can.
- You don't have to be an "artist" to draw. Drawing can be another form of note-taking, a way to record what you notice about something. Your drawings are just for you, they will help you to remember the neat stuff you discover such as: the number of legs a spider has, the shape of a slug trail or the very first signs of spring. In your logbook you can include pictures from magazines, a delicate bird feather, leaves, or other flat objects. The longer you use your logbook, the more valuable it will be to you.

b) Invite a naturalist, museum curator or other person in your community to speak to your class about the important natural features of your area

- Organize a field trip to one of these "features," and have your class explore different aspects of it.
- Afterwards, put on a "Celebrate the Wilds" day, where the class hosts an open house and presents their projects.

c) Get to know wildlife first hand

- Visit a park or a wildlife sanctuary.
- Find out about an area in your community that provides critical habitat for birds or animals and is also at risk of being developed.
- Don't forget the wildlife in your own backyard and neighbourhood!
  - Take a walk to the local playground or green space.
  - How many bird songs do you hear along the way?
  - What wildlife do you see?

Great Blue Heron

d) Find out about The Wild Animal and Plant Protection Act that was passed in 1993

- How does this act protect the plants and animals that live in Canada?
- Which B.C. plants and animals are protected by this act?
- Design a poster about animal and plant protection.
- See Appendix 4—*Resources Section* for contacts and endangered species and spaces brochures: Canadian Wildlife Service, and BC Ministry of Environment, Lands & Parks.

e) Respect the natural areas you visit

- Remember that plants and animals live there.
- Think about the impact your presence has on wildlife.
- Write a story about one or two things you would like to do to reduce your impact on wildlife, then do it.

f) Design a poster promoting protected natural areas, such as a favourite local park

Use some of the reasons for protection expressed during the interviews.

Appendices

Appendix 1 —British Columbia's Biogeoclimatic Zones*

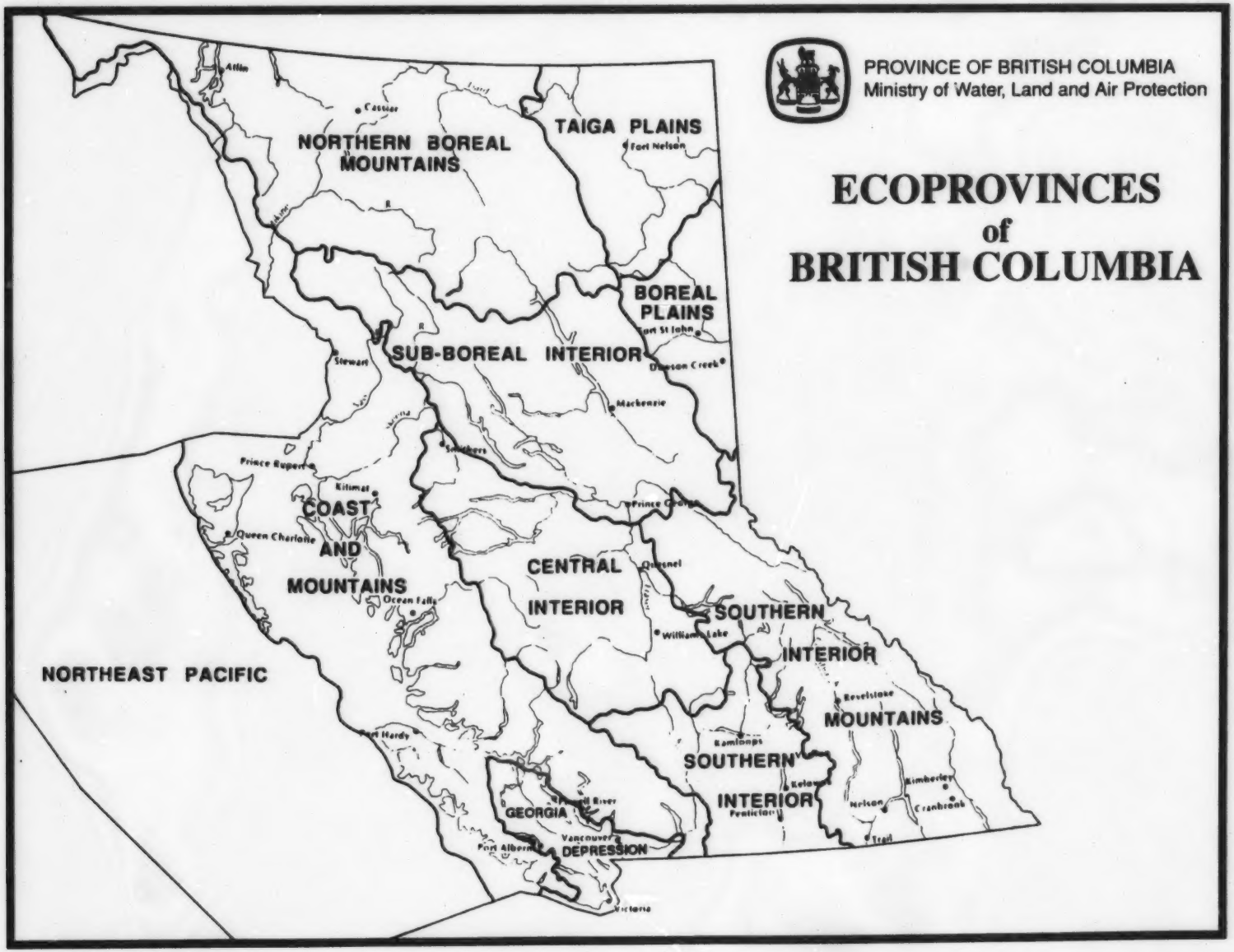
Biogeoclimatic Zone	Some Plants & Animals
Coastal Douglas-fir Zone is limited to a small part of Vancouver Island, several islands in the Gulf of Georgia and a narrow strip of the mainland with warm, dry summers and mild, wet winters.	• Brandt's cormorant, Anna's hummingbird, Western red-backed salamander, Townsend's big-eared bat • red honeysuckle, Indian-plum, Douglas-fir, arbutus, Garry oak
Coastal Western Hemlock Zone covers much of Vancouver Island and the coast to the Queen Charlotte Islands, and is the rainiest zone in B.C. with cool summers and mild wet winters.	• black-tailed deer, northern sea lion, Pacific tree frog, osprey • Indian pipe, western hemlock, western redcedar, twinflower
Mountain Hemlock Zone occurs all along the coast in B.C. at higher elevations than the previous zone, and features steep terrain, and heavy snow fall in the winter.	• common raven, Vancouver Island marmot, cougar, snowshoe hare • yellow-cedar, mountain hemlock, amabilis fir
Bunchgrass Zone makes up the grasslands found in the major southern valleys of the province, featuring hot dry summers and cool winters with little snowfall.	• coyote, Rocky Mountain elk, western meadowlark, western yellow-bellied racer • sagebrush, bluebunch wheatgrass, prickly-pear cactus
Ponderosa Pine Zone is the driest zone in B.C., occurring along the very dry valleys in the interior, with very hot dry summers, and cool winters with little snow.	• badger, little brown myotis, black-billed magpie, western rattlesnake • prickly-pear cactus, yellow bell, ponderosa pine
Interior Douglas-fir Zone is found at middle elevations in the interior of B.C., with long warm and dry summers, and cool winters.	• black bear, white-tailed deer, northern pygmy-owl, northern pocket gopher • balsam-root, Douglas-fir, lodgepole pine
Interior Cedar-Hemlock Zone occurs in southeastern B.C., with cool wet winters and warm dry summers, and has the highest number of trees of any zone.	• downy woodpecker, golden eagle, moose, wolverine • wild ginger, western redcedar, western hemlock, grand fir
Montane Spruce Zone occurs in middle elevations in the interior, with cold snowy winters and short warm summers.	• caribou, three-toed woodpecker, fisher, porcupine • black huckleberry, bunchberry, lodgepole pine
Sub-Boreal Pine-Spruce Zone occurs on the high plateau in the west central interior of B.C., mostly within the Chilcotin, having cold dry winters and cool dry summers.	• sandhill crane, trumpeter swan, red fox, wood frog, grizzly bear • sundew, white spruce, kinnikinnick
Sub-Boreal Spruce Zone is the mountainous area of B.C.'s central interior, with severe snowy winters, and warm short summers.	• deer mouse, gray wolf, marten, great gray owl • black huckleberry, white spruce, subalpine fir, soopolallie
Engelmann Spruce Zone is the highest forested zone in most of B.C., having long cold winters and cool short summers.	• lynx, mule deer, northern flying squirrel, red crossbill • glacier lily, Engelmann spruce
Boreal White and Black Spruce Zone is found in the northeast of the province, occurring from the Yukon to Newfoundland, with short growing seasons, very long winters, but light snowfall.	• mountain goat, grizzly bear, wood bison, black-throated green warbler • trembling aspen, white spruce, tamarack
Spruce-Willow-Birch Zone is the most northerly subalpine zone in the province, with long cold winters and brief cool summers.	• Stone sheep, spruce grouse, red squirrel, least weasel • pink mountain-heather, willow
Alpine Tundra Zone occurs on high mountains throughout the province, includes glaciers and snowfields, and has the harshest climate in B.C.—cold and snow most of the year, with only a short growing period.	• gyrfalcon, white-tailed ptarmigan, hoary marmot, arctic ground squirrel • arctic willow, scrub birch, arctic lupine, Sitka valerian

*Available for download from *www.for.gov.bc.ca/research/becweb/becinfo/bec-view.htm*

Appendix 2 — British Columbia's Ecoprovinces

Ecoprovince	Some Plants & Animals
Northeast Pacific is the oceanic portion of British Columbia west of the Continental Slope.	• northern fur seal, sperm whale, laysan albatross, Pacific white-sided dolphin, northern fulmar, albacore, pink-footed shearwater, basking shark, ocean sunfish
Coast and Mountains includes the west side of the Coast Mountains and Vancouver Island, all of the Queen Charlotte Islands, and the adjacent Continental Shelf.	• Vancouver Island marmot, killer whale, bald eagle, red-throated loon, clouded salamander, eulachon, pacific halibut • western hemlock, twinflower, Pacific silverweed
Georgia Depression lies between the Vancouver Island Mountains and the southern Coast Mountains. It is a large basin containing the Strait of Georgia and Puget Sound.	• Roosevelt elk, Trowbridge's shrew, crested myna, barn owl, Townsend's mole, glaucous-winged gull, • Garry oak, Douglas-fir
Central Interior Ecoprovince lies to the east of the Coast Mountains between the Fraser Basin and the Thompson Plateau, and contains the Chilcotin and Cariboo Plains.	• moose, California bighorn sheep, sandhill crane, western jumping mouse, Dolly Varden trout, Barrow's goldeneye • Engelmann spruce, lodgepole pine, trembling aspen
Sub-Boreal Interior lies to the east of the Coast Mountains and to the west of the Interior Plains in the north-central part of British Columbia.	• grizzly bear, lynx, boreal owl, magnolia warbler, western toad, arctic grayling, slimy sculpin • black spruce, subalpine fir
Southern Interior Mountains lies east of the southern interior plateaus in the southeastern portion of the province including the Columbia Mountains, the Southern Rocky Mountain Trench, and the Rocky Mountains eastern flanks.	• mountain goat, elk, hoary marmot, painted turtle, osprey, black-billed cuckoo, northern leopard frog, white sturgeon • ponderosa pine, western larch
Southern Interior lies east of the crest of the Coast and Cascade ranges and west of the Columbia Mountains, including the Thompson Plateau, the eastern portion of the Cascade Ranges.	• white-throated swift, western rattlesnake, great basin spadefoot toad, northern squawfish great basin pocket mouse, spotted bat, burrowing owl • arrow-leafed balsamroot, bluebunch wheatgrass, whitebark pine, ponderosa pine
Boreal Plains lies east of the Rocky Mountains, south of the Fort Nelson Lowlands, extending eastward across northern Alberta, Saskatchewan, Manitoba and southern Northwest Territories.	• Gray wolf, black-backed shrew, upland sandpiper, Connecticut warbler, northern pike, pearl dace, striped chorus frog, • white spruce, balsam poplar, soopolallie
Taiga Plains lies to the east of the northern Rocky Mountains in the northeastern portion of British Columbia as a large lowland dissected by the Liard, Fort Nelson and Pettiot Rivers.	• black bear, northern red-backed vole, lesser yellowlegs, spruce grouse, western toad, lake whitefish • paper birch, tamarack
Northern Boreal Mountains lies east of the Boundary Ranges of the Coast Mountains, west of the Interior plains, and south of the Yukon Territory in the north-central portion of British Columbia.	• thinhorn sheep, wolverine, tundra vole, chinook salmon, gyrfalcon, rock ptarmigan, Bohemian waxwing, lake trout • fireweed, twinflower, black spruce

*Adapted from Dennis A. Demarchi (1993), *An Introduction To The Ecoregions Of British Columbia,* Wildlife Branch, Ministry of Environment, Lands and Parks, Victoria, British Columbia. A brief on-line version of this document can be found, including maps, at the Ministry of Sustainable Resource Management website (*srmwww.gov.bc.ca/rib/wis/eco/bcecode.html*).


PROVINCE OF BRITISH COLUMBIA
Ministry of Water, Land and Air Protection
ECOPROVINCES
of
BRITISH COLUMBIA
NORTHERN BOREAL MOUNTAINS
TAIGA PLAINS
BOREAL PLAINS
SUB-BOREAL INTERIOR
COAST AND MOUNTAINS
CENTRAL INTERIOR
SOUTHERN INTERIOR MOUNTAINS
SOUTHERN INTERIOR
GEORGIA DEPRESSION
NORTHEAST PACIFIC
Atlin
Cassiar
Fort Nelson
Fort St John
Dawson Creek
Stewart
Mackenzie
Prince Rupert
Kitimat
Prince George
Quesnel
Queen Charlotte
Ocean Falls
Williams Lake
Revelstoke
Port Hardy
Kamloops
Kelowna
Kimberley
Nelson
Cranbrook
Penticton
Trail
Powell River
Vancouver
Port Alberni
Victoria

Appendix 3—National Parks and National Historic Sites, World Heritage Sites, & Provincial Parks

1. National Parks and National Historic Sites

National Parks—Role and Purpose

Parks Canada: National parks protect, for all time, outstanding examples of Canada's major natural environments. These special places celebrate the beauty and variety of our land and wildlife which have shaped our history, and protect the biophysical and biological diversity of Canada. National parks also provide opportunities for all Canadians to understand, appreciate and enjoy this natural heritage in ways that leave it unimpaired for future generations. National parks are protected under legislation of the Parliament of Canada. There are six national parks in B.C.

National parks are part of a broader family of Canadian heritage lands that includes provincial and territorial parks, wildlife areas, heritage rivers, regional parks, ecological reserves and land under private stewardship. The international significance of some of these lands has been recognised through their designation as World Heritage Sites or Biosphere Reserves.

National Historic Sites

National Historic Sites protect and present the story of historical places, events and persons that have shaped our nation. National Historic Sites in B.C. that are managed by Parks Canada include:

- Roger's Pass National Historic Site
- Kicking Horse Pass National Historic Site
- Yellowhead Pass National Historic Site
- Athabasca Pass National Historic Site
- Chilcoot Trail National Historic Site
- Fort Langley National Historic Site
- Fort St. James National Historic Site
- Kitwanga Fort National Historic Site
- Fort Rodd Hill National Historic Site
- Fisgard Lighthouse National Historic Site
- Gulf of Georgia Cannery National Historic Site
- Ninstints National Historic Site and World Heritage Site

Contacts

For information on **B.C.'s national parks** and for a complete list of over 70 **national historic sites**, contact:

Parks Canada Agency
Western Canada Service Centre
300 - 300 West Georgia Street
Vancouver, BC V6B 6B4
Phone: (604)666-0176
Fax: (604) 666-7957

or

Parks Canada Agency
Coastal BC Field Unit
2nd Floor, 711 Broughton Street
Victoria, BC V8W 1E2
Phone: (250) 363-3511
Fax: (250) 363-8522

The Internet address for Parks Canada is:
www.parkscanada.gc.ca

or contact the parks directly:

Mount Revelstoke National Park and Glacier National Park
P.O. Box 350
Revelstoke, BC V0E 2S0
Phone: (250) 837-7500
Fax: (250) 837-7536

Kootenay National Park
P.O. Box 220
Radium Hot Springs, BC V0A 1M0
Phone: (250) 347-9615
Fax: (250) 347-9980

Pacific Rim National Park Reserve
P.O. Box 280
Ucluelet, BC V0R 3A0
Phone: (250) 726-7721
Fax: (250) 726-4720

Gwaii Haanas National Park Reserve/Haida Heritage Site, and National Marine Conservation Area
P.O. Box 37
Queen Charlotte City, BC V0T 1S0
Phone: (250) 559-8818
Fax: (250) 559-8366

Yoho National Park
P.O. Box 99
Field, BC V0A 1G0
Phone: (250) 343-6324
Fax: (250) 343-6330

2. UNESCO World Heritage Sites

This designation recognizes heritage resources of global importance and includes the following:

- **Ninstints, located in Gwaii Haanas National Park Reserve**
- **The Tatshenshini-Alsek Wilderness Park**
- **The Canadian Rocky Mountain Parks: Banff, Yoho, Jasper & Kootenay National Parks, and Mount Assiniboine, Mount Robson & Hamber Provincial Parks**

3. Provincial Parks

B.C.'s Provincial Parks—Role and Purpose

- to conserve and manage for future generations a wide variety of outstanding park lands which represent the best natural recreation features and diverse wilderness environments of the province.
- to provide province-wide opportunities for a diversity of high quality and safe outdoor recreation that is compatible with conserving the natural environment.

Protected Areas Strategy

Representativeness

To protect viable, representative examples of the natural diversity of the province:

- major terrestrial, marine and freshwater ecosystems
- characteristic habitats, hydrology and landforms
- characteristic backcountry recreational and cultural heritage values

Special Features

To protect the special natural, cultural, heritage and recreational features of the province, including:

- rare and endangered species and critical habitats
- outstanding or unique botanical, zoological, geological and paleontological features
- outstanding or fragile cultural heritage features
- outstanding outdoor recreational features

Contacts

There are more than 800 provincial parks in B.C., several of which are listed in the table on p. 96. For information on **B.C. Provincial Parks**, contact the district offices, or:

BC Parks
PO Box 9398 STN PROV GOVT
Victoria, BC V8W 9M9
Phone: (250) 387-5002 Fax: (250) 387-5757
wlapwww.gov.bc.ca/bcparks/

District Offices

1. **Strathcona District**
   Rathtrevor Beach Park
   Box 1479
   Parksville, BC V9P 2H4
   Phone: (250) 954-4600
   Fax: (250) 248-8584

2. **South Vancouver Island District**
   RR #6
   2930 Trans Canada Hwy
   Victoria, BC V9E 1K3
   Phone: (250) 391-2300
   Fax: (250) 478-9211

3. **Lower Mainland District**
   1610 Mt. Seymour Road
   North Vancouver, BC V7G 1L3
   Phone: (604) 924-2200
   Fax: (604) 924-2244

4. **Garibaldi-Sunshine Coast District**
   Alice Lake Park
   Box 220
   Brackendale, BC V0N 1H0
   Phone: (604) 898-3678
   Fax: (604) 898-4171

5. **Thompson River District**
   1210 McGill Road
   Kamloops, BC V2C 6N6
   Phone: (250) 851-3000
   Fax: (250) 828-4633

6. **Okanagan District**
   Okanagan Lake Park
   Box 399
   Summerland, BC V0H 1Z0
   Phone: (250) 494-6500
   Fax: (250) 494-9737

7. **East Kootenay District**
   Wasa Lake Park
   Box 118
   Wasa, BC V0B 2K0
   Phone: (250) 422-3212
   Fax: (250) 422-3326

8. **Skeena District**
   Box 5000
   3790 Alfred Avenue
   Smithers, BC V0J 2N0
   Phone: (250) 847-7320
   Fax: (250) 847-7659

9. **Cariboo District**
   181 First Avenue North
   Williams Lake, BC V2G 1Y8
   Phone: (250) 398-4414
   Fax: (250) 398-4686

10. **Prince George District**
    Box 2045
    4051 18th Avenue
    Prince George, BC V2N 2J6
    Phone: (250) 565-6340
    Fax: (250) 565-6940

11. **Peace-Liard District**
    250 - 10003 110th Avenue
    Fort St. John, BC V1J 6M7
    Phone: (250) 787-3407
    Fax: (250) 787-3490

Black Bear

4. National and Provincial Parks by Ecoprovince

The following table lists the national parks and a few examples of the almost 600 provincial parks by ecoprovince. An asterisk (*) indicates parks that may have interpretive programs. Please contact the park office nearest you for more information.

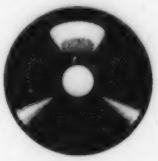
Ecoprovinces	National Parks	Provincial Parks and Park District #	
Northern Boreal Mountains		• Tatshenshini-Alsek Wilderness, Mount Edziza, Spatsizi Plateau	8
		• Liard River Hotsprings, Muncho Lake, Stone Mountain	11
Southern Interior		• EC Manning*, Stein Valley	3
		• Ts'yl-os	9
		• Okanagan Falls*, Cathedral, Bear Creek*, Ellison*, Okanagan Lake*, Haynes Point*	6
		• Herald*, Lac Le Jeune*, Shuswap Lake*, Monck*	5
Southern Interior Mountains	*Columbia Mountains* • Glacier National Park* • Mt. Revelstoke National Park* *Rocky Mountains* • Yoho National Park* • Kootenay National Park*	• Bowron Lake	9
		• Kokanee Glacier, Kokanee Creek*, Champion Lakes*, Valhalla	7
		• Mount Robson*, Hamber	10
		• Wasa Lake*, Bugaboo, Kikomun Creek*, Mount Assiniboine	7
		• Wells Gray*	5
Sub-Boreal Interior		• Kakwa, Carp Lake	10
		• Mount Edziza, Babine Mountains, Spatsizi Plateau Wilderness	8
Taiga Plains		• Maxhamish Lake, Parker Lake	11
Coast and Mountains	• Pacific Rim National Park Reserve* • Gwaii Haanas National Park Reserve	• Ts'yl-os	9
		• Cultus Lake*, Sasquatch*	3
		EC Manning*	6
		• Khutzeymateen, Lakelse Lake*, Tweedsmuir, Tatshenshini-Alsek Wilderness, Naikoon	8
		• Alice Lake*, Porteau Cove*, Garibaldi*	4
		• Golden Ears*	3
		• Strathcona*	1
Georgia Depression		• French Beach*, Gordon Bay*, Goldstream*, Ruckle*, Bamberton*, Montague Harbour*, Sidney Spit Marine*	2
		• Porpoise Bay*, Desolation Sound Marine	4
		• Rathtrevor Beach*, Strathcona*, Miracle Beach*, Newcastle Island Marine*	1
Boreal Plains		• Beatton, Swan Lake	11
Central Interior		• Ts'yl-os	9
		• Tweedsmuir, Tyhee Lake*	8
Northeast Pacific	• Gwaii Haanas National Park Reserve		

Appendix 4—Resources Section: People, Places and References for Information and Action

People, places, and references for more information, maps, brochures, speakers, and funding sources for your own protected areas projects!

List of Agencies and Organizations

The following is a list of federal, provincial and regional agencies with responsibilities involving parks, ecological reserves, wildlife and protected areas. Teachers and students are encouraged to contact groups to receive information, invite guest speakers to talk on specific topics, and inquire where they can actively participate. For additional groups, please refer to the lists of agencies in *Project WILD* and *Backyard Biodiversity and Beyond* learning resources.



NOTE: You can use the services of Enquiry BC to reach any British Columbia government phone number. From Victoria, call 387-6121; from Vancouver and area, dial 660-2421; elsewhere in the province, dial 1-800-663-7867.

1. Many local naturalist groups are collecting information on protected areas and lobbying for local critical habitat. Contact your local group or contact:

   The Federation of BC Naturalists
   321-1367 West Broadway
   Vancouver, BC V6H 4A9
   Phone: (604) 737-3057 Fax: (604) 738-7175
   www.naturalists.bc.ca

2. To ask about the **Environmental Choice Program (ECP)** contact:

   ECP
   c/o Terra Choice Env. Services Inc.
   Suite 300, 2197 Riverside Dr.
   Ottawa, Ontario K1H 7X3
   Phone: (613) 247-1900
   www.environmentalchoice.com

3. For **Environmental Citizenship** information, contact:

   Environmental Citizenship
   Environment Canada
   606-1200 W. 73rd Avenue
   Vancouver, BC V6P 6H9
   Phone: (800) 667-7779 Fax: (604) 261-4111
   www.envircitizen.org

. Use your local library to find **groups who are active in your local area** or refer to *The Green List: A Guide to Canadian Environmental Organizations and Agencies*, produced by the Canadian Environmental Network (1992), or contact the BC Environmental Network:

BC Environmental Network
1672 E. 10th Avenue
Vancouver, BC V5N 1X5
Phone: (604) 879-2279 Fax: (604) 879-2272
www.bcen.bc.ca

5. For more information about **British Columbia's Protected Areas Strategy**, to propose a protected area, or comment on existing ones, contact:

Land Use Coordination Office
2nd Floor, 836 Yates Street
Victoria, BC V8V 1X4
Phone: (250) 953-3471 Fax: (250) 953-3481
www.luco.gov.bc.ca

7. For information on **BC Provincial Parks**, contact your district office (see Appendix 3), or

BC Parks and Protected Areas
395 Waterfront Crescent
Victoria, BC V8T 5K7
Phone: (250) 387-5002 Fax: (250) 387-5757
www.env.gov.bc.ca/bcparks

8. For a wide assortment of **provincial maps**, contact:

LandData BC
1st Floor, 810 Blanshard St.
Victoria, BC V8V 1X4
Phone: (250) 387-6316 Fax: (250) 356-7831
www.landdata.gov.bc.ca/

9. For a **wall-sized biogeoclimatic zone map** ($14 + tax), contact:

Ministry of Forests
Map Sales
1450 Government Street
Victoria, BC V8V 3E7
Phone: (250) 387-8688
www.for.gov.bc.ca/research/becweb/becinfo/bec-view.htm

10. For information about **National Parks**, contact:

    Department of Canadian Heritage
    Pacific and Yukon Region
    300-300 W. Georgia Street
    Vancouver, BC V6B 6C6
    Phone: (604) 666-0176 Fax: (604) 666-3508
    www.parkscanada.gc.ca

    See also Appendix 3—*National Parks and Historic Sites, World Heritage Sites & Provincial Parks.*

11. For information about **Marine Conservation Areas,** contact Department of Canadian Heritage (see above) and ask for: Sea to Sea to Sea—Canada's National Marine Conservation Areas System Plan (1995).
    www.parkscanada.gc.ca/nmca/nmp_e.htm

    This is an easy-to-read document with clear maps, wildlife illustrations, and good descriptions of Canada's marine environments and resources.

12. For **BC Endangered Species and Spaces Brochures**, contact:

    Ministry of Water, Land and Air Protection
    4th Flr. 2975 Jutland Rd.
    Victoria, BC V8W 9M1
    Phone: (250) 387-9737 Fax: (250) 356-9145
    wlapwww.gov.bc.ca/wld/list.htm

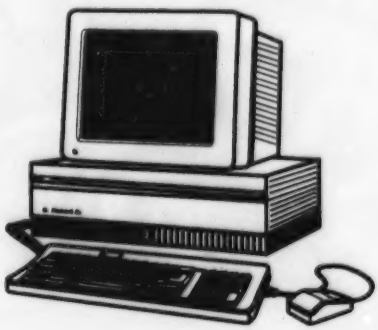
13. **Naturescape British Columbia: Caring for wildlife habitat at home**, contact:

    NatureScape British Columbia
    Habitat Conservation trust Fund
    4th Flr. 2975 Jutland Rd.
    Victoria, BC V8W 9M1
    Phone: (800) 387-9853 or (604) 387-9369
    www.hctf.ca/nature.htm

14. For free copies of the **Tree Book: Learning to Recognize Trees of British Columbia,** contact:

    Ministry of Forests
    Communications Branch
    3rd Floor, 595 Pandora Avenue,
    Victoria, BC V8W 9C3
    Phone: (250) 387-5255 Fax: (250) 387-8485
    www.for.gov.bc.ca/pab/publctns/treebook/index.htm

15. For information about the **Biosphere Reserve** program of the Canadian Man and the Biosphere Program, go to:
    www.cciw.ca/mab/mab.html



16. The **Protected Areas Virtual Library** is an information service developed by the World Conservation Monitoring Centre, working in close collaboration with the IUCN Commission on National Parks and Protected Areas.
www.unep-wcmc.org/protected_areas/pavl/index.html

17. Information about **World Heritage Sites** can be found at the UNESCO World Heritage Centre:
www.unesco.org/whc/nwhc/pages/home/pages/homepage.htm

Funding Agencies

Several organizations provide funding for habitat enhancement and protection activities. Send in your ideas!

1. **Canadian Wildlife Federation**
Habitat 2000: Schools Project and Education Kits
2740 Queensview Drive
Ottawa, Ontario K2B 1A2
Phone: (800) 563-9453 Fax: (613) 721-2902
www.cwf-fcf.org

2. **Evergreen Foundation: Greening Schoolyards**
#404-134 Abbott St.
Vancouver, BC V6B 2K45
Phone: (604) 689-0766 Fax: (604) 669-6222
www.evergreen.ca/en/index.html

3. **Shell Environmental Fund**
P.O. Box 100 Station M
Calgary, Alberta T2P 2H5
Phone: (403) 691-3198 Fax: (403) 269-8031
www.shell.ca/code/values/environment/sef.html

4. **VanCity Credit Union**
Community Action and Education Department
P.O. Box 2120 Stn. Terminal
Vancouver, BC V6B 5R8
Phone: (604) 877-7000
www.vancity.com

5. **Toronto Dominion Friends of the Environment Fund**
700 West Georgia Street
TD Tower - 3rd Floor
Vancouver, BC V7Y 1A2
Phone: (604) 654-8832 FAX: (604) 654-5531
www.td.com/fef/

6. **Public Conservation Assistance Fund**
   Ministry of Water, Land and Air Protection
   PO Box 9354 Stn Prov Gov
   Victoria, BC V8W 9M1
   Phone: (800) 387-9853
   wlapwww.gov.bc.ca/hctf/pubcon/

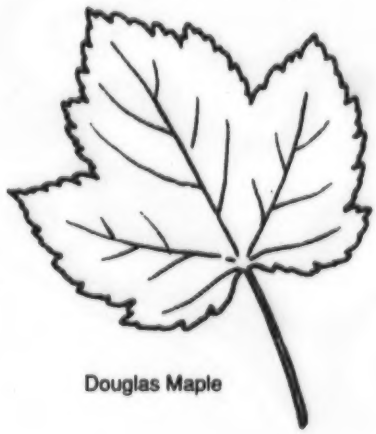
Teachers!

Get involved with our provincial and national environmental education groups!

EEPSA (Environmental Education Provincial Specialists Association)
c/o BC Teachers Federation
100-550 W. 6th Avenue
Vancouver, BC V5Z 4P2
www.bctf.bc.ca/psas/eepsa

EECOM The Canadian Network for Environmental Education and Communication
Station B, P.O. Box 948
Ottawa, Ontario K1P 5P9
www.eecom.org

Wild BC
Habitat Conservation Trust Fund
PO Box 9354 Stn Prov Govt
Victoria, BC V8W 2H1
(250) 356-7111
wlapwww.gov.bc.ca/hctf/wild.htm



Douglas Maple

Appendix 5—Environmental Literacy Guidelines

(from McClaren *et al*, 1995)

In its simplest terms, environmental literacy might be defined as having well developed knowledge, skills, and awareness in matters of the environment. While steward-ship reflects a deep caring for the environment, literacy reflects a thorough understanding of it. Just as there are key attributes of an environmental steward, there are key attributes for a person who is environmentally literate.

Role Of Schools In Developing Environmental Literacy

Schools play a critical role in helping students become environmentally literate. In order to foster the development of environmentally literate students, school programs must focus on the following areas:

- critical thinking
- active participation of students
- investigation of values issues
- cooperation between others
- commitment to lifelong learning
- teaching students how to gain access to information
- thinking in wholes, not just in parts
- exploring cause and effect relationships
- teaching students how to respond accordingly and act appropriately

Red Crossbill

This learning resource strives to promote this type of teaching and learning. The key concepts, the activities, the case study, and the action principles will give teachers ideas for helping their students develop into environmentally literate citizens.

Attributes of an Environmentally Literate Person

An environmentally literate person is someone who:

1. **Thinks about systems**

   The message of modern ecology is that everything is ultimately connected to everything else. It may be convenient, and even necessary, to separate a system into components in order to analyze and understand it, but it is critical to think about the entire system as a whole.

   Technology makes our lives easy, but it also separates us from the consequences of our actions. We don't know where our electrical power is produced, or where our wastes go when they disappear down the drain. An environmentally literate person thinks about systems. He or she understands where things come from, where they go, and how much energy and material is used along the way.

2. **Thinks in time**

   An environmentally literate person can forecast, think ahead, and plan. The quick "fixes" of today often turn out to be the beginnings of serious environmental problems in years to come. Many human beings in the modern world seem to have difficulty thinking beyond the term of their own life span. Most environmental problems will not be solved quickly and will require extended effort over many years. An environmentally literate person has the ability to think ahead.

3. **Thinks critically about value issues**

   Almost all modern problems, environmental or otherwise, have an important component based on human value systems. Contemporary society is pluralistic and multicultural. We do not necessarily share a common, culturally agreed upon set of values. Therefore, we do not all agree on how to solve the problems of the environment. An environmentally literate person has the ability to think critically about what is of value for all living species. What we value is reflected in our actions. If we truly value a healthy environment, we may have to sacrifice some of our old ways of thinking and acting.

Deer Mouse

4. **Separates number and quantity from quality and value**

   In the structure of modern life, it often appears to be less expensive to pollute and waste than it is to conserve. Questions that are at the core of many environmental decisions tend to focus on the numbers or quantities of goods and the costs of solutions. For example: Why do we need more trees? Why should we try to have high-quality clean water? How much will this cost?

   We assign numbers to things that should really be assigned qualities. We assume that because we have enumerated things, we have addressed their value. An environmentally literate person has the ability to separate cost from value. He or she recognizes the importance of striving for value and quality over the long-term, rather than settling for solutions which may be faster or more cost-effective in the short-term.

5. **Distinguishes between the map and the territory**

   Many of our notions about the environment may in fact, be elaborate stereotypes. We are surrounded by high quality representations of the world; photos in full colour, video, stereo, models, simulations, and even virtual realities. These representations can be useful in helping us to understand components of the environment. But we can become so fond of our maps, that we forget that they may not be entirely faithful representations of the way things are.

   An environmentally literate person has the ability to understand and see the environment as it truly is. He or she understands the importance of conserving natural environments—even wild or forbidding places that bear no real resemblance to the "picture perfect" representations we have become accustomed to seeing.

6. **Moves from awareness, to knowledge, to action**

   The need to have people take personal actions which contribute to the solution of environmental problems has been widely recognized by environmental education writers. A popular slogan has been: "Think Globally, Act Locally."

   An environmentally literate person is able to see the link between knowledge and action. He or she understands that data alone carries no automatic set of instructions for converting it into appropriate actions. Data itself makes no decisions. An environmentally literate person understands that growth in knowledge often leads to a need for acting politically or interacting with various community groups.

Engelmann Spruce

7. **Learns and relearns**

   There are concepts to be learned and useful facts to be recalled in the course of developing environmental literacy. Ecological principles and ideas help organize experiences in the environment and provide insights which lead to critical thinking about environmental issues.

   An environmentally literate person understands biological and geological cycles, bioenergetics, food and energy relationships, and concepts such as adaptation and diversity. He or she also understands how to access information and evaluate its quality. Knowing how to find up-to-date information is an important aspect of environmental literacy. The environmentally literate person expects that many of the things he or she learns today may be different tomorrow, and that new things will have to be learned. The environmentally literate person is committed to lifelong learning.

8. **Works cooperatively with other people**

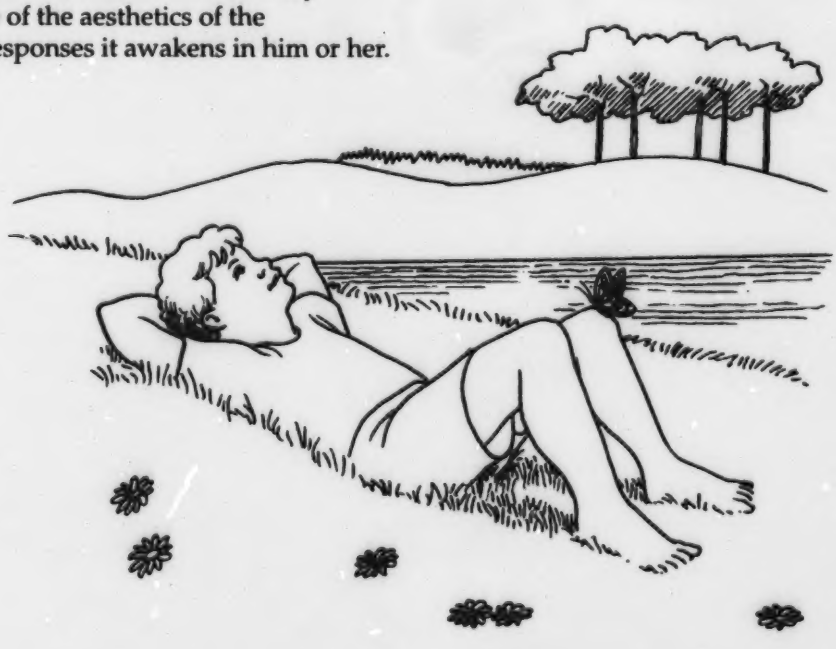
   It is difficult to imagine that any modern environmental problem can be solved by a single person. Many environmental issues are complex and will require international cooperation as well as cooperation among neighbours in local communities. An environmentally literate person has effective skills in group processes and communication. He or she has the ability to work in interdisciplinary teams and to employ citizen participation.

9. **Uses skills in eight processes: knowing, inquiring, acting, judging, opening, imagining, connecting, and valuing**

   This set of skills represents an "ecosystem" of processes that are essential to effective intelligence. Although they are not specific to environmental literacy (they are necessary in many forms of education), an environmentally literate person is able to use and apply all of these skills when presented with environmental issues.

10. **Develops an aesthetic response to the environment**

    Many scientific research projects were started because the investigator became enthralled with an interesting and beautiful plant or animal. An environmentally literate person is aware of the aesthetics of the environment and the responses it awakens in him or her.



Appendix 6—On Journalling

Journals are powerful. They are a place where students can sort their thoughts and express their interest in scientific research, their sheer joy in experiencing nature or their love for the art of writing or drawing. Introduce journalling with a few specific tasks. Later, unstructured time can be set aside each day for students to record their experiences, ideas, reflections and insights. Journals should be portable and durable enough to carry and use outside.

Throughout the guide, you will notice "journalling" questions. These may provide stimulating entry points into journalling. On the other hand, please don't allow the questions to limit personal expression! Poetry, sketches, stories and charts are as much a part of journalling as reflective writing.

> *The best aid to the untrained eye is a sharpened pencil.*
>
> Louis Aggasiz, 19th century Swiss biologist

Encourage students to draw! Producing great works of art is unimportant— but taking time to look at things closely enough to sketch them is extremely rewarding. Sketching plants, animals or landscapes can help foster connections with nature, which is part of what the journals in this curriculum are all about.

Journals can also be used as an informal way to assess students' performance and development, but care should be taken to inform students that their journals will be looked at. Journals can contain personal information that some students may not want to share: instead, specific sections or journal tasks might be requested for evaluation purposes or discussion in small groups.

A few suggestions for journalling:

1. Develop your personal sense of place by describing (in any medium)
   - your earliest memories of being in nature
   - other early memories of places
   - a special experience in nature
2. Develop your sense of yourself as a part of nature by describing (in any medium)
   - experiences with animals or plants
   - times spent watching leaves rustle or clouds change shape
   - times spent star gazing, peering at the moon, floating aimlessly on the water or soaking up the sun
3. Think about the importance of protected areas by describing (in any medium)
   - a favourite natural area you have visited
   - how you imagine that place in 20 years
   - what has happened in between

For more information and activities on journalling, see *Project WILD*: "Wild Words . . . A Journal-Making Activity."

Appendix 7—Reasons to Protect Natural Areas

The following list of reasons to protect natural areas was adapted from: M. Hummel, Ed, (1989), *Endangered Spaces: The Future for Canada's Wilderness*, Toronto, Key Porter Books.

Aesthetic	Like great works of art, wilderness has a value worth preserving.
Agriculture & Medicine	Protected wild plants and animals have been shown to be valuable to humans for agricultural, medicinal and technological purposes. For example, wild vegetables have specific genes that are resistant to diseases that kill our domestic varieties. Medicinal herbs and wildlife have been used for centuries by humans to cure illness.
Cultural	Wilderness is cultural enrichment for artists, musicians, writers and poets.
Ecological/ Environmental	The biological diversity of plant and animal systems in natural areas must be protected for the survival of species, including humans. Protected areas play an increasingly important role in the health of Earth's atmosphere, water and soil.
Economic	Some environmentalists argue that economic reasons are not valid when applied to establishing wilderness areas and that other reasons should prevail. There is also concern that economic reasons may compromise the wilderness values of such areas. However, economic arguments can be motivating factors. For example, tourism and the job creation that goes with it is a prime motivator for establishing parks. Historically, job creation around and in parks has initiated regional economic development in several areas of Canada.
Education	Parks serve as outdoor classrooms and museums that link an ever-urbanizing population to its natural roots. Environmental education and park interpretation play major roles in many parks.
Health & Recreation	Outdoor recreation does not necessarily require pristine wilderness, but the powers of wild places in reducing stress and offering sanctuary are invaluable to our mental health and are of great benefit to our physical well-being.
Heritage	People are a reflection of their natural and cultural heritage. As Canadians, if we lose our wilderness we lose our ability to understand the past and ourselves. Maintaining public ownership of wilderness and natural resources is fundamental to protecting them for this and future generations.
Intrinsic	All life has a right to exist for its own sake. Establishing a park to protect wild species is one form of respecting this right.
Scientific Research	Natural areas offer baseline data for scientific research and act as indicators to environmental quality.
Spiritual	The protection of sacred places is a function of many parks. These places are usually identified by aboriginal people: for example, in Australia, Ayers Rock; in British Columbia, South Moresby of the Queen Charlotte Islands and the Stein Valley near Lillooet.

Appendix 8—Glossary

Adaptation – a hereditary characteristic that improves an individual's chances for survival and reproduction in a given environment.

Caribou

Agriculture – the art or science of cultivating the ground, including the harvesting of crops, and the rearing and management of live stock; tillage; husbandry; farming

Amphibians – a cold-blooded, smooth-skinned vertebrate of the class Amphibia, such as a frog, toad or salamander, that characteristically hatches as an aquatic larva with gills. The larva then transforms into an adult having air-breathing lungs.

Anthropocentric values – believing that everything is on this earth for human use; literally "human-centered."

Archives – the place where a collection of records and other documents are kept. These documents may be about an individual, a family, a community, a culture, etc.

Biocentric values – believing that humans are just one species among many with no more rights than others, and all species have intrinsic value; literally "life-centered."

Biogeoclimatic Zone – a geographic area having similar patterns of energy flow, vegetation and soils as a result of a broadly similar climate

Biogeography – the science that studies the distribution of organisms.

Biotic Communities – a set of organisms living together in space and time

Buffer Zones – A strip of land, usually used as a park or designated for a similar use, separating land dedicated to one use from land dedicated to another use

Carnivores – animals such as frogs, hawks, coyotes and snakes, which feed on other animals.

Communities – all of the populations within a given area and how they interact. For instance, a lake community would involve the phytoplankton, zooplankton, filter-feeding fish, carnivorous fish, amphibians, birds, parasites, all of the invertebrates, decomposers, aquatic plants, as well as animals such as beavers, and muskrats.

Community – the populations of plant and animal species living and interacting in a given area.

Compost – A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients.

Consensus – a decision-making process which values individual viewpoints and opinions.

Conservation – managing human-use or protection of natural resources and the environment for present and future generations.

Conservation ethic – an ethic based on the concept of a self-sustaining society in terms of its energy and materials use, an ethics ethics that includes all other animals, plants, water and soil, or collectively, the total biosphere

Cost/Benefit Analysis – a form of analysis that tries to quantify the dollar impacts of a particular decision in terms of what the decision will cost, and what benefits will be returned.

Cultural heritage – the meaningful traditions and objects which connect our families to their traditional roots.

Cultural Site – a location where there is evidence of human activity, usally related to past events, such as historical or archaeological sites

Culture – the pattern of knowledge, beliefs, behaviours and traditions characteristic of a particular community of people. People express culture through art, literature, the popular media, folklore, customs, buildings and clothing.

Decision-making - the process, whether by a group or an individual, of coming to a decision

Decomposers – organisms such as bacteria, fungi, molds, termites, slugs and maggots that break down dead animals and plants into simpler substances that can be reused by plants, thus completing the cycling of chemicals through the biosphere.

Decomposing materials – dead plant or animal matter.

Degradation – changing to a lower state, degeneration; deterioration

Domesticated – animals or plants dependent on humans; generally live and breed in captivity.

Ecoregion Classification System

This is a ecosystem classification system based on geographic features of an area, climate, landforms, plants and animals. They define areas where the shape of the land, the weather, and the plants and animals are different from other areas. For example, mountains are different from plains, and dry grassy hills are different from wet coastal forests.

The ecoregion system includes **eco-provinces, ecoregions,** and **ecosections,** which are units of progressive amounts of detailed information used to specifically classify and describe the great diversity of ecosystems in the province. For example:

- **Ecoprovince** – a landscape region generally characterized by biological and physical characteristics, such as climate, landforms, plants and animals. There are 10 ecoprovinces in B.C. (See the Ecoprovince List in Appendix 2, and *Backyard Biodiversity and Beyond* for more ecoprovince information, maps and activities.)
- **Ecoregion** – an area characterized by having similar climate, landforms, plants and animals. There are 33 ecoregions in B.C.
- **Ecosection** – an area where the climate, landforms, plants and animals are quite specific to that region. There are 110 different ecosections in B.C.

NOTE: The **biogeoclimatic zone system** of land classification, also referred to in this guide, groups regions according to climate and uses plant species as indicators of regional climate. The two systems complement one another.

Ecosystem – a self-regulating natural community of living things interacting with one another and with their nonliving physical environment.

Edge effect – the edge is the area where two ecosystems meet. The edge effect results from the changes in temperature, humidity, plants and animals that occur at or near an edge.

Endangered – a species threatened with imminent extinction or extirpation throughout all or most of its range.

Environmentally Sensitive Area - areas requiring special management attention to protect important scenic values, fish and wildlife resources, historical and cultural values, and other natural systems or processes.

Environmental values – a value stance that places the non-human world at the same plane of respect as that afforded humans

Extinction – the complete disappearance of a species.

Extirpation – a species no longer existing in the wild in a particular place, but occurring elsewhere.

First Nations – the aboriginal populations of British Columbia

Forestry – The science and art of cultivating, maintaining, and developing forests

GAP Analysis – a term coined by geographers and biologists who use maps and information about characteristics and use of areas to determine where there are "gaps" in regions that need protection.

Greenway – a corridor of undeveloped land, as along a river or between urban centers, that is reserved for recreational use or environmental preservation

Habitat island – any geographically isolated pocket of natural community or habitat. Mountain tops and ponds are natural habitat islands. Forests fragmented by such activities as urban, recreational and economic development are examples of human-created habitat islands.

Habitat – the place where an organism lives and is provided with food, water, shelter and living space, varying in size from an entire forest, to a pond, to the intestine of a termite!

Herbivores – organisms, such as deer, mice, cows, and rabbits, that eat plants.

Heritage – the set of all things, places and ideas we have inherited from the past that are special, including both natural and human-built elements, and that are important to protect for future generations.

Heritage site – see Cultural site

Impact – the effect or impression of one thing on another

Interdependent – living things in an ecosystem interact with and depend on one another and with their physical environment (air, water, soil, heat, solar energy, wind, chemicals).

Limiting factor – factors such as space, temperature, light, water, or a chemical that limits the existence, growth, abundance or distribution of an orga

Management – the act, manner, or practice of managing; handling, supervision, or control

Micro-habitat – a small habitat within a larger one in which the natural conditions (temperature, humidity, light, etc.) differ from those in the larger habitat. A hole in a tree trunk or an animal carcass is a micro-habitat within the forest.

Mining – to excavate the earth for the purpose of extracting ore or minerals

Native plants – plants indigenous to an area

Native plants – plants indigenous to an area

Organic material – material derived from the remains or products of living organisms

Organism – an individual form of life, such as a plant, animal, bacterium, protist, or fungus

Offspring – the progeny or descendants of a person, animal, or plant considered as a group.

Park – a large area of land preserved in its natural state as public property

Partnerships – a relationship between individuals or groups that is characterized by mutual cooperation and responsibility, as for the achievement of a specified goal

Perspective – a way of regarding situations or topics etc

Population – the number of individuals of a particular species found in a defined area.

Predator – an organism that captures, kills and feeds on other organisms.

Preservation – to keep safe from injury, harm or destruction.

Protection – to keep from being damaged, attacked, stolen, or injured; guard

Prey – organisms that are captured and killed by predators.

Producers – organisms (usually green plants) that use the sun's energy to make organic materials from simple chemicals.

Protected areas – both natural and human-created areas set aside for their special or unique features. Protected areas include regional, provincial and national parks as well as museums, flower gardens, libraries, and historical buildings.

Provincial Park – those protected areas designated under the Parks Act

Recycle – to put or pass through a cycle again

Responsibility – the state of being responsible, accountable, or answerable, as for a trust, debt, or obligation.

Shelter – cover from elements such as sun, rain, snow, temperature, and predators. Organisms use shelter for breeding activity, raising offspring, camouflage, travel and bedding. Shelter might include a tree, a log, a rock, a shell, a river or an ocean.

Source habitats – places from which individual members of a species can disperse

Species dispersal – the movement of organisms away from a location such as a point of origin.

Species diversity – the different types of plants, animals and micro-organisms that live in a region.

Species – a group of organisms that look alike and are so similar genetically that they are capable of producing fertile offspring.

Mule Deer

Stakeholder – one who has a share or an interest, as in an enterprise

Steward – one who manages another's property, finances, or other affairs

Stewardship activities – the activities of a steward

Stewardship groups – groups of people who come together for a common purpose of caring for something that they don't own

Sustainable – to keep in existence; maintain

Threatened – a species likely to become endangered if the factors affecting its vulnerability are not reversed.

Tourism – the practice or business of traveling for pleasure

Wilderness area – a largely undisturbed area which supports primarily native species.

Wildlife – animals that are not tamed or domesticated, which may include organisms which are so small they can only be seen by humans with the aid of a microscope, or are as large as a whale.

Appendix 9—References on Protected Areas and B.C. Flora & Fauna

This list contains some resources for students and teachers wishing to further explore the area of protection and protected areas.

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Pamphlet Series from the Ministry of Water, Land and Air Protection

Contact: Biodiversity Branch
Ministry of Water, Land and Air Protection
PO Box 9374 STN PROV GOVT
Victoria, BC V8W 9M4
Phone: (250) 837-9145
Fax (250) 387-9145

1. Mammal Fact Sheets

All of these brochures can be ordered from the Wildlife Branch, or downloaded as .pdf (Adobe Acrobat) files from *wlapwww.gov.bc.ca/wld/index.htm* and clicking on the 'Publications' button.

- Bison in British Columbia
- Caribou in British Columbia
- Cougar in British Columbia
- Mule and Black-tailed Deer in British Columbia
- White-tailed Deer in British Columbia
- Elk in British Columbia
- Mountain Goat in British Columbia
- Thinhorn Sheep in British Columbia
- Bighorn Sheep in British Columbia
- Moose in British Columbia
- Black Bears in British Columbia
- Bats in British Columbia

2. Wildlife and Ecosystems in British Columbia at Risk Series

All of these brochures can be ordered from the Wildlife Branch, or downloaded as .pdf (Adobe Acrobat) files from *wlapwww.gov.bc.ca/wld/index.htm*

Ecosystems at Risk in British Columbia

- Antelope-brush Ecosystems
- Coastal Douglas-fir Ecosystems
- Cottonwood Riparian Ecosystems of the Southern Interior
- Garry Oak Ecosystems

Species at Risk in British Columbia

- American White Pelican
- Badger
- Burrowing Owl
- Extinct and Extirpated Species
- Freshwater Molluscs

Red-backed Salamander

- Great Basin Spadefoot Toad
- Marbled Murrelet
- Mountain Caribou
- Nooksack Dace
- Northern Spotted Owl
- Pacific Giant Salamander
- Pacific Water Shrew
- Painted Turtle
- Purple Martin
- Rare Butterflies of Southeastern
- Vancouver Island and the Gulf Islands
- Rare Forest Plants of Southern British Columbia
- Rare Grassland Plants
- Rare Invertebrates of the South Okanagan
- Rare Warblers of Northeastern British Columbia
- Sage Thrasher
- Salish Sucker
- Sandhill Crane
- Sea Otter
- Spotted Bat
- Stickleback Species Pairs
- Tailed Frog
- Townsend's Big-Eared Bat
- Townsend's Mole
- Vancouver Island Marmot
- Western Grebe
- Western Rattlesnake
- White Sturgeon
- White-headed Woodpecker

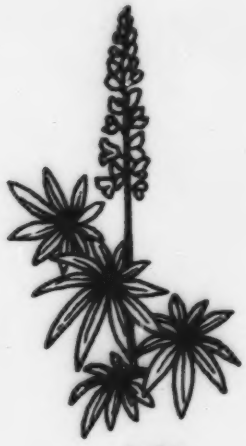
Pamphlets from the Ministry of Forests

Contact: Forest Communications
Ministry Forests
595 Pandora Ave 1st floor
Victoria, BC V8W 3E7
Phone: (250) 387-5255
Fax: (250) 387-8485

The brochures listed below are all available as .pdf downloads from *www.for.gov.bc.ca/hfd/pubs/Bro.htm*

- Brochure 66, Understanding Ecosystem Processes
- Brochure 62, The Ecology of the Montane Spruce Zone
- Brochure 61, The Ecology of the Spruce- Willow-Birch Zone
- Brochure 60, The Ecology of the Ponderosa Pine Zone
- Brochure 59, The Ecology of the Sub-Boreal Pine-Spruce Zone
- Brochure 56, The Ecology of the Alpine Tundra Zone

- Brochure 55, The Ecology of the Engelmann Spruce – Subalpine Fir Zone
- Brochure 54, The Ecology of the Bunchgrass Zone
- Brochure 53, The Ecology of the Sub-Boreal Spruce Zone
- Brochure 52, Coastal Montane Biodiversity
- Brochure 51, The Ecology of the Mountain Hemlock Zone
- Brochure 50, Broadleaved Trees, Unsung Components of British Columbia's Forests
- Brochure 49, The Ecology of the Boreal White and Black Spruce Zone
- Brochure 48, The Ecology of the Interior Cedar-Hemlock Zone
- Brochure 47, The Ecology of the Interior Douglas-fir Zone
- Brochure 45, Adaptive Management Brochure
- Brochure 31, The Ecology of the Coastal Western Hemlock Zone
- Brochure 30, The Ecology of the Coastal Douglas-fir Zone
- Brochure 24, ROTTEN LUCK, The Role of Downed Wood in Ecosystems
- Brochure 19, An Ecological Framework For Resource Management
- Brochure 15, Approaches To Maintaining Biological Diversity in British Columbia's Forests
- Brochure 09, Genes, Trees and Forests
- Brochure 06, Biodiversity Facts
- Brochure 01, Ecosystems of British Columbia



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Appendix 10—Curriculum Links

	GRADE 5 LEARNING OUTCOMES	SECTION ONE *What Does Protection Mean?*					SECTION TWO *Why Do We Protect?*				SECTION THREE *How Do We Decide What to Protect?*				SECTION FOUR *Caring for Protected Areas*			
		1-1	1-2	1-3	1-4	1-5	2-1	2-2	2-3	2-4	3-1	3-2	3-3	3-4	4-1	4-2	4-3	4-4
SCIENCE	Describe how humans use B.C.'s living resources		✔		✔	✔	✔		✔	✔								
	Describe the known and potential environmental impacts of using B.C.'s living resources		✔		✔	✔	✔	✔	✔			✔						
	Devise a strategy for sustaining a living resource		✔		✔	✔	✔					✔						
	Identify living resources in the local environment				✔	✔	✔	✔										
	Use appropriate technologies to record, measure, save, and retrieve data																	
	Classify and order based on a set of keys and criteria							✔	✔		✔							
	Use appropriate technologies to record, measure, save, and retrieve data							✔		✔	✔							
	Identify relevant variables in an experiment								✔		✔							
	Identify ways science is used responsibly in their communities									✔								
	Differentiate between relevant and irrelevant information									✔								
	correctly state a hypothesis										✔							
SOCIAL STUDIES	Develop alternative interpretations from varied sources	✔							✔	✔								
	Demonstrate an understanding of the concepts of sustainability, stewardship, and renewable versus non-renewable natural resources		✔			✔	✔	✔						✔				
	Use outlines to organize information into coherent presentations			✔	✔			✔		✔	✔	✔	✔					
	Analyse the relationship between the development of communities and their available natural resources				✔					✔				✔				
	Assess the effects of lifestyles and industries on local and global environments		✔				✔	✔	✔					✔				
	Explain ways people preserve and transmit culture		✔	✔	✔		✔											
	Gather and record a body of information from a variety of primary and secondary sources				✔			✔		✔	✔	✔						
	Design, implement, and assess strategies to address community problems or projects					✔			✔				✔					
	Defend a position on a regional issue in light of alternative perspectives								✔									
	Demonstrate an awareness of the history of Aboriginal peoples' rights													✔				
	explain how supply and demand are affected by population and the availability of resources										✔							

		1-1	1-2	1-3	1-4	1-5	2-1	2-2	2-3	2-4	3-1	3-2	3-3	2-5	4-1	4-2	4-3	
LANGUAGE ARTS	Demonstrate respect for the diverse languages, ideas, opinions, cultures, and contributions of their peers	✔		✔	✔				✔	✔								
	Compare their preferences for, opinions about, and responses to several selections	✔					✔		✔									
	Locate and interpret details to answer specific questions or to complete tasks	✔						✔			✔							
	Use a variety of written and graphic forms, including charts, webs, and maps, to organize details and information		✔			✔		✔			✔							
	Identify what they know about topics selected by the class or by groups of students		✔			✔								✔				
	Identify and use sources of information, including people, print, audio-visual media, and electronic media			✔	✔					✔		✔						
	Formulate questions that are relevant to specific audiences and purposes			✔		✔												
	Assume a variety of roles when interacting in groups				✔				✔		✔							
	Create various communications for their own satisfaction, including journals and diaries	✔					✔											
	Describe the purpose and key features of what they read, hear, and view						✔											
	Select and shape information appropriately for specific audiences and purposes							✔						✔				
	Make explicit connections among central ideas in works that they have read, viewed, or heard		✔											✔				
	Describe information contained in simple and direct illustrations, maps, charts, or other graphic representations				✔			✔			✔							
	Use strategies, including developing questions, rereading, reading further, and reviewing, to clarify meaning and build understanding								✔	✔		✔						
	Demonstrate pride and satisfaction in using language to create and express thoughts, ideas, and feelings in a variety of oral, written, and electronic forms						✔							✔				
PERSONAL PLANNING	Use appropriate strategies to share and express feelings and emotions	✔	✔	✔			✔											
	Demonstrate an appreciation of the impact of decisions that they have made	✔	✔	✔	✔				✔	✔		✔						
	Identify factors that can affect their personal futures		✔															
	Relate their activities to personal interests			✔	✔													
	Demonstrate a commitment to participate in the development of a healthy school and community				✔		✔	✔	✔	✔								
	Identify the talents and abilities people use in their roles in families, schools, and communities					✔		✔	✔									
	Demonstrate safe behaviour in a variety of environments						✔	✔		✔								
	practise responsible and systematic decision making											✔						

GRADE 6 LEARNING OUTCOMES		SECTION ONE *What Does Protection Mean?*					SECTION TWO *Why Do We Protect?*				SECTION THREE *How Do We Decide What to Protect?*				SECTION FOUR *Caring for Protected Areas*			
		1-1	1-2	1-3	1-4	1-5	2-1	2-2	2-3	2-4	3-1	3-2	3-3	3-4	4-1	4-2	4-3	4-4
SCIENCE	Compare ways of solving problems and finding explanations	✔	✔	✔				✔	✔	✔	✔		✔					
	Use instruments to make a variety of direct measurements							✔	✔	✔								
	Organize and interpret information in simple tables and graphs							✔			✔							
	Demonstrate an appreciation of the importance of keeping honest and unbiased scientific records							✔	✔	✔	✔							
	Draw reasonable conclusions from experiments							✔	✔	✔	✔							
	Design a scientific test and evaluate its fairness							✔	✔	✔	✔							
SOCIAL STUDIES	Organize information from a variety of sources into a structured presentation using more than one form of representation		✔	✔	✔							✔		✔				
	Assess the relationship between cultures and their environments		✔	✔			✔	✔	✔	✔				✔				
	Support a position on a national issue by considering competing reasons from various perspectives							✔	✔	✔								
	Demonstrate an understanding of the concept of global citizenship						✔	✔	✔	✔								
LANGUAGE ARTS	Use questioning, predicting, summarizing, inferring, skimming or scanning, and graphic organizers to accomplish specific purposes for reading, viewing, and listening		✔	✔		✔	✔	✔	✔	✔	✔	✔	✔					
	Use information they have read, heard, or viewed to develop questions and activities that will extend their understanding	✔	✔	✔	✔	✔	✔	✔	✔	✔		✔		✔				
	Organize details and information they have read, heard, or viewed using a variety of written and graphic forms, including charts, webs, and maps		✔	✔	✔		✔	✔	✔	✔		✔	✔	✔				
	Locate and interpret details to answer specific questions or complete tasks	✔	✔	✔	✔		✔	✔	✔	✔		✔	✔	✔				
	Compare their own opinions with information presented		✔	✔	✔	✔	✔	✔	✔	✔				✔				
	Describe what is known about topics or issues and check for gaps in the information available																	
	Locate, gather, select, and record information for specific purposes from various human, print, and electronic sources																	
	Demonstrate pride and satisfaction in using language to express their thoughts, ideas, and feelings in various written, oral, visual, and electronic forms		✔					✔	✔	✔		✔		✔				
	Paraphrase and elaborate on the ideas of others to clarify and extend understanding	✔	✔	✔				✔	✔	✔			✔	✔				

		1-1	1-2	1-3	1-4	1-5	2-1	2-2	2-3	2-4	3-1	3-2		2-5		4-2	4-3	4-4
PERSONAL PLANNING	Predict possible problems associated with particular situations or courses of action	✓	✓	✓					✓	✓								
	Evaluate personal decisions they have made	✓	✓	✓					✓	✓								
	Describe their individuality and cultural identity within a social group	✓	✓	✓			✓	✓	✓	✓								
	Demonstrate acceptance and responsibility for their choices as they develop personal autonomy	✓	✓	✓					✓	✓								
	Practise effective work habits						✓	✓	✓	✓								
	Demonstrate examples of positive interpersonal skills	✓	✓	✓		✓												
	Compare their own talents and skills with those of people they admire					✓												
	Identify transferable skills that are developed through school, and through recreational, cultural, sports, and extra-curricular activities and interests					✓												

GRADE 7 LEARNING OUTCOMES		SECTION ONE *What Does Protection Mean?*					SECTION TWO *Why Do We Protect?*				SECTION THREE *How Do We Decide What to Protect?*				SECTION FOUR *Caring for Protected Areas*			
		1-1	1-2	1-3	1-4	1-5	2-1	2-2	2-3	2-4	3-1	3-2	3-3	3-4	4-1	4-2	4-3	4-4
SCIENCE	Propose and compare options when making decisions or taking action	✔	✔	✔	✔			✔	✔	✔	✔		✔					
	Select appropriate equipment and techniques to collect useful quantitative and qualitative information			✔				✔	✔	✔	✔		✔					
	Evaluate conclusions in relation to other evidence and sources							✔	✔	✔	✔		✔					
	Describe ways in which species interact with each other						✔	✔			✔	✔						
	Collect, analyze, and interpret data on environmental quality collect, analyze, and interpret data on environmental quality							✔	✔	✔	✔							
	Analyze costs and benefits of alternative scientific choices related to a community problem				✔					✔	✔							
SOCIAL STUDIES	Generate and justify interpretations drawn from primary and secondary sources generate and justify interpretations drawn from primary and secondary sources						✔	✔	✔	✔		✔						
	Organize information into formal presentations using several forms of representation			✔				✔	✔	✔		✔	✔	✔				
	Describe and evaluate impacts of natural processes and human-induced changes on communities all people are influenced by their environment and how the environment is affected by human activity.		✔		✔	✔	✔	✔	✔	✔								
	Defend a position on a global issue by considering competing reasons from various perspectives		✔						✔	✔								
LANGUAGE ARTS	Use information they have read, heard, or viewed in a variety of written or graphic forms, including written notes and charts	✔	✔	✔	✔							✔		✔				
	Interpret details in simple and direct illustrations, maps, charts, and other graphic representations		✔		✔	✔	✔	✔	✔	✔		✔		✔				
	Identify viewpoints and opinions in literary and informational communications		✔	✔			✔		✔	✔				✔				
	Develop personal responses and offer reasons for and examples of their judgments, feelings, or opinions	✔	✔	✔			✔	✔	✔	✔				✔				

		1-1	1-3	1-3	1-4	1-5	2-1	2-3	2-3	2-4	3-1	3-2	3-3	3-4	4-1	4-3	4-3	4-4
LANGUAGE ARTS	Demonstrate pride and satisfaction in using language to create and express their thoughts, ideas, and feelings through a variety of oral, written, and electronic forms demonstrate pride and satisfaction in using language to create and express their thoughts, ideas, and feelings through a variety of oral, written, and electronic forms	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	✓				
	Share responsibility for the effective functioning of groups		✓	✓	✓		✓	✓		✓	✓		✓	✓				
	Express agreement or disagreement with information	✓	✓				✓	✓		✓				✓				
	Develop strategies for resolving conflict and solving problems		✓	✓					✓				✓	✓				
	Use language to display empathy, acknowledge others' viewpoints, express the value of others' ideas, and invite participation	✓	✓	✓			✓	✓	✓	✓								
PERSONAL PLANNING	Predict or suggest possible problems associated with particular situations or courses of action	✓	✓	✓									✓					
	Identify and demonstrate positive behaviours that show respect for individuals' potential, interests, and cultural backgrounds	✓	✓	✓		✓	✓											
	Practise co-operative decision making				✓								✓					
	Make effective use of services and resources that can help them carry out their plans			✓	✓													

Appendix 11—Case Studies for Local Protected Areas

The following provincial parks have local case studies developed. These case studies can bring the concepts presented in this learning resource closer to home for your students. They can be ordered from BC Parks District Extension Officers (see Appendix 4) or download these case studies from the WILD BC web site *www.hctf.ca/wild/resources/protectedareas/protectedareas.htm*

Alice Lake Provincial Park (Garibaldi/Sunshine Coast District)

Champion Lakes Provincial Park (Kootenay Distict)

Goldstream Provincial Park (South Vancouver Island District)

Kikomun Creek Provincial Park (Kootenay Distict)

Kokanee Creek Provincial Park (Kootenay Distict)

Lakelse Lake Provincial Park (Skeena District)

Sargeant Bay Provincial Park (Garibaldi/Sunshine Coast District)

Syringa Provincial Park (Kootenay Distict)

T'sylos Provincial Park (Cariboo District)